October 20, 1958

Paper Trade Journal

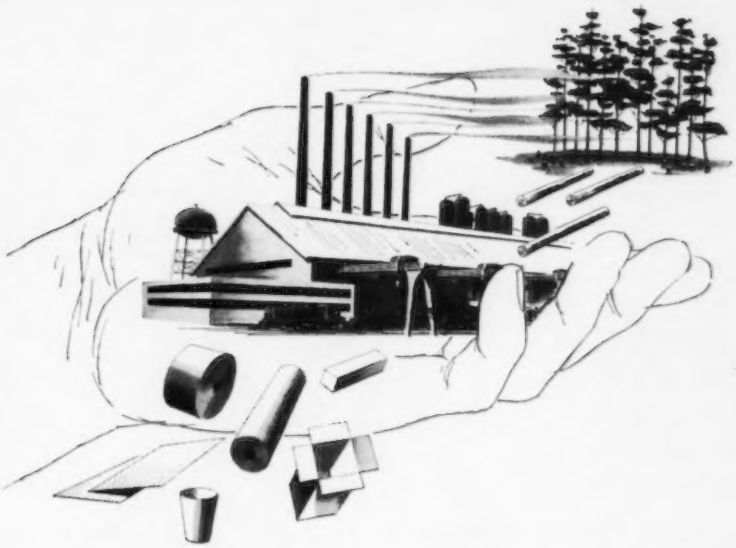
Great Lakes Proves Out World's Widest Paper Machine

Bleaching Method Revealed at Deinking Conference

Wide Variety of Starches for Coating Adhesives

C-Z President Layton Views the Paper Industry

When Gottesman enters the picture...



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Everything at Gottesman is geared to make good production performance easy for you. With Gottesman service, you are assured the right supplies for your specific needs—and prompt, expert handling in a wide range of grades. That's why you get superior performance, consistently.

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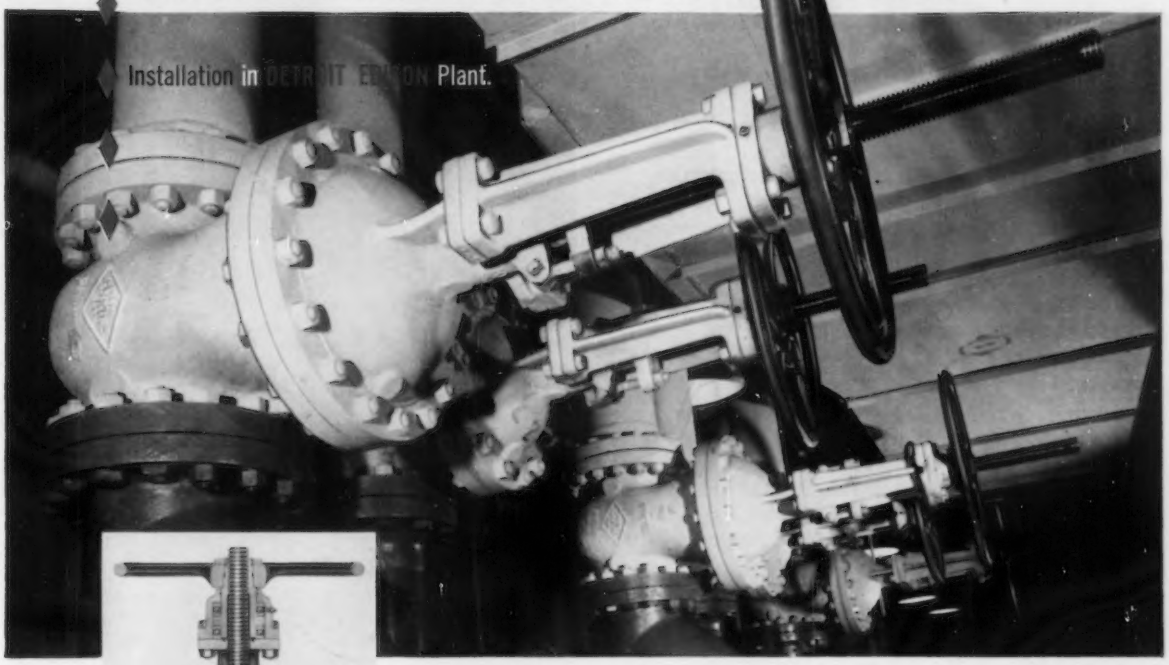
Chemical cleaning service for industry DOWELL

where they really know Costs

—you'll likely see the famous Jenkins mark on CAST STEEL Valves



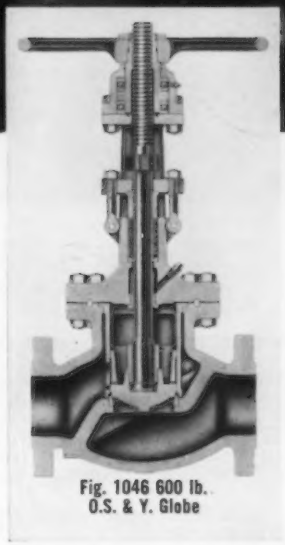


Fig. 1046 600 lb. O.S. & Y. Globe

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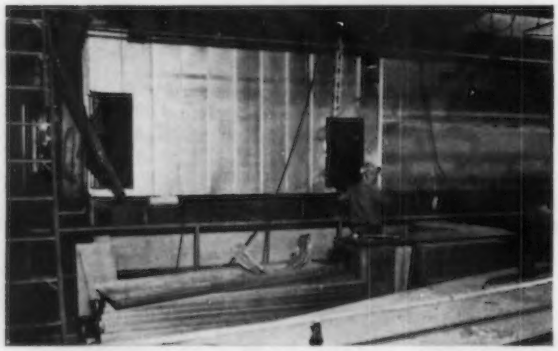
The multiple advantages of ALUMINIZED STEEL Type 2 make it ideal not only in boiler casings and ducts, but for stacks and insulation jacketing for piping and processing units such as dryers. It also has proved economical for pulp and paper mill buildings and building additions. For complete information, just fill out and mail the coupon.



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Entered as Second Class Matter at the post office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 North Crystal St., East Stroudsburg, Pa. Printed in U.S.A.
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REMEMBER THESE DATES

Nov. 10-12: National Paperboard Assn. Annual Meeting, Waldorf-Astoria Hotel, New York City
Jan. 28-30, 1959: Canadian Pulp and Paper Assn. Annual Meeting, Queen Elizabeth Hotel, Montreal
Feb. 23-26, 1959: TAPPI Annual Meeting, Hotel Commodore, New York City

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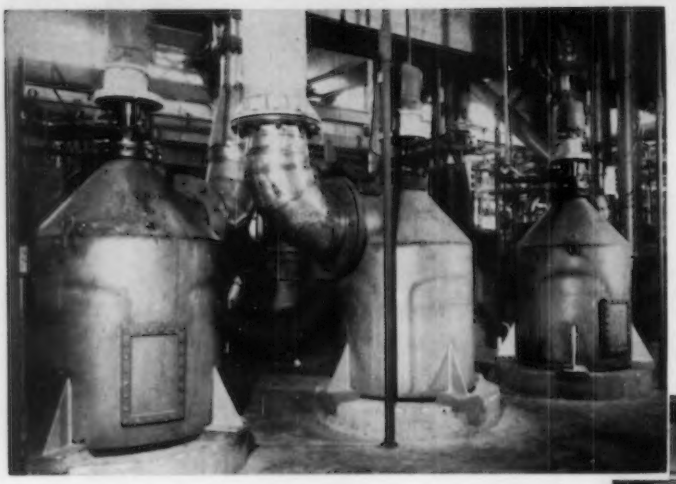
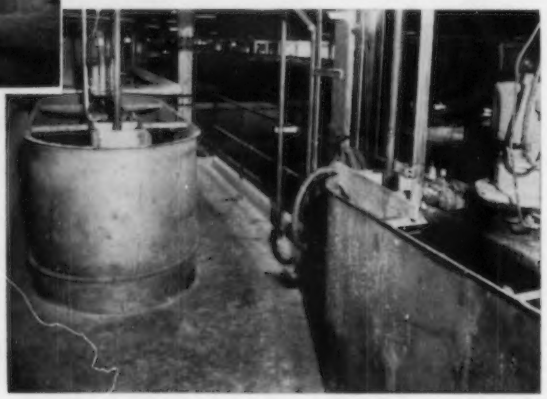
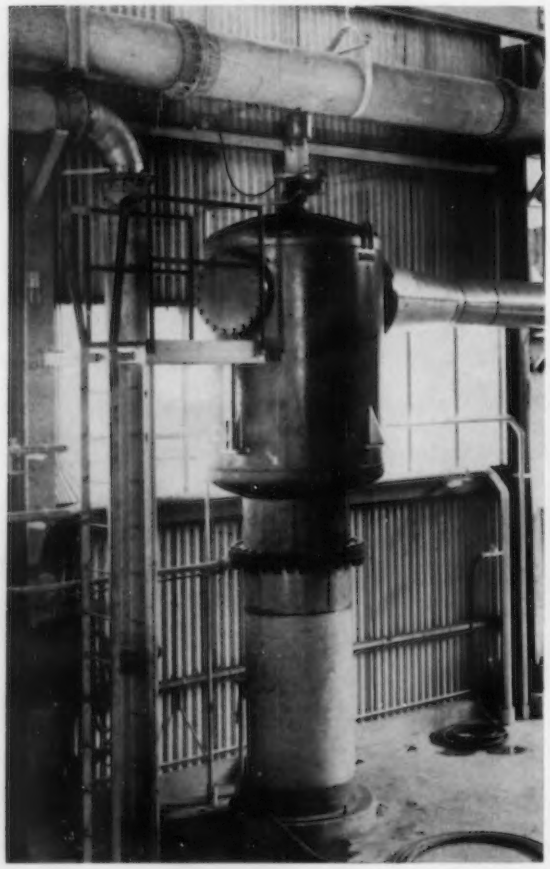


14 REGULATORS INSTALLED ON PAPER MACHINE STOCK SYSTEM!

St. Regis Paper Company, Jacksonville, Florida, specified DeZurik Stock Consistency Regulators for the stock system of their new paper machine. Fourteen DeZurik Regulators are in use on a variety of installations. Here are some of the reasons for St. Regis' choice.

These three DeZurik Pipeline Regulators control hardwood and pine stock directly ahead of magnetic flowmeters, operating accurately under pressure, eliminating the need for headboxes.





The DeZurik Open Regulators, pictured above, control the consistency of the primary and secondary stock to the fan pump and act as headboxes. They handle the full volume of stock—not just a sample. No extra piping system is needed for sampling lines and pumps—no problem in getting an accurate sample.

This huge DeZurik Pipeline Regulator, left, accurately controls consistency of the stock to the refiners at a design rate of 1100 tons per 24 hours. DeZurik Pipeline Regulators can be installed at any convenient location regardless of elevation.

For any flow rate—for any installation—there's a versatile DeZurik Stock Consistency Regulator that will provide accurate, dependable service. Write for more details.

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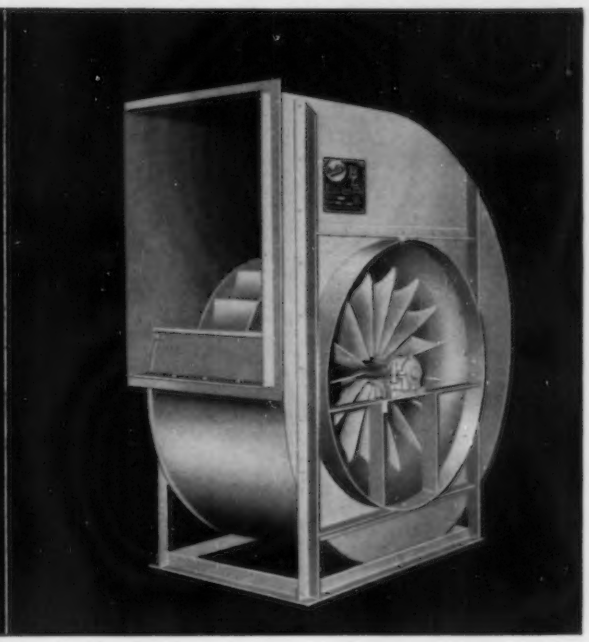
For Classes III-IV (High Pressures) The "Buffalo" Type "BLH" Fan



For Classes I-II (Moderate Pressures) The "Buffalo" Type "BL" Fan

FOR THE BEST ENGINEERED JOBS, SPECIFY BUFFALO "JOB-SUITED" FANS

For central system applications you don't have to accept a "compromise fan", loosely designed to cover any and all pressure requirements. "Buffalo" builds *two* fans, each engineered to fulfill specific pressure requirements to the highest possible degree. Brief engineering details on these "no compromise" "Buffalo" Fans are given below.

The "Buffalo" Type "BLH" Fan is recognized by engineers and contractors alike for its outstanding performance in Classes III and IV service. The "BLH" maintains an extremely high mechanical efficiency of 86% over a broad operating range. The smooth inlet bell with matching shroud, directional inlet vanes, backward-curved blades and divergent outlet all contribute to quiet operation and minimum turbulence. "Buffalo" engineering features, plus husky construction, add up to an efficient high pressure fan that will deliver long, faithful, maintenance-free service. When you plan a conduit system or other Class III-IV installation, be sure to specify the "BLH". Call in your "Buffalo" representative or write for Bulletin F-200.

The "Buffalo" Type "BL" Fan has gained wide acceptance for peak performance in major Class I and II installations throughout the country. Non-overloading, the "BL" provides quiet, stable, output from free delivery to shutoff. The smoothly-curved inlet bell, with directional guide vanes and matching shroud, assures minimum turbulence. Highest efficiency is attained by the streamlined wheel with backward curved blades, factory tested and balanced to hold vibration to an absolute minimum. The correctly shaped scroll of the wheel-contoured housing further contributes to smooth air flow. For full information on the rugged, reliable "BL" Fan for Class I and II conditions, contact your "Buffalo" engineering representative. Or, write direct for Bulletin F-104.

You get a *value dividend* with the "Q" Factor — the built-in QUALITY that provides trouble-free satisfaction and long life in *every* "Buffalo" product.

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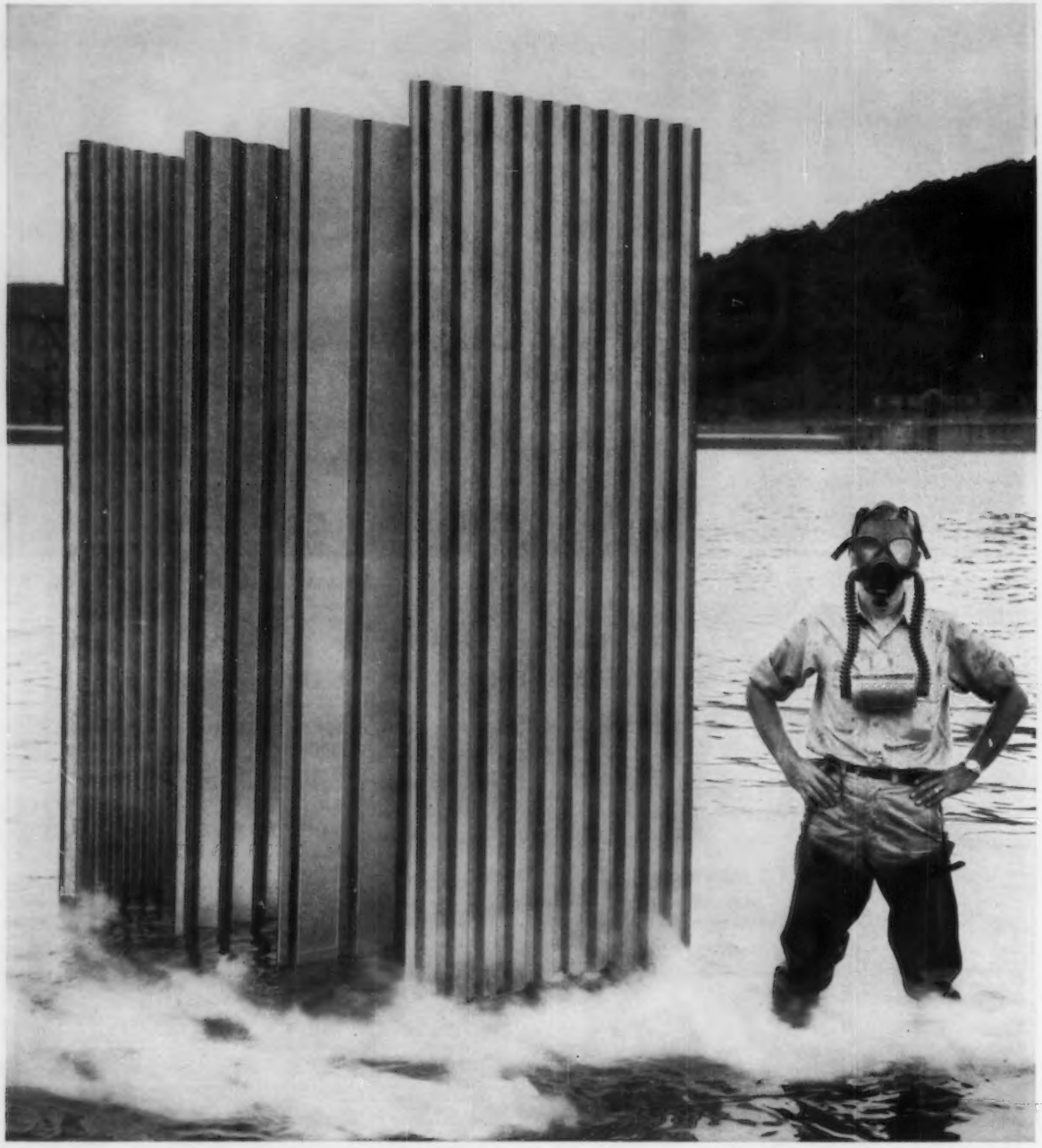

BEAT CORROSION WITH ALCOA ALUMINUM!

Moisture, chemical fumes, industrial atmospheres are no problem with Alcoa® Aluminum industrial building products. They defy corrosion. Never need costly painting or maintenance. First cost is last cost with aluminum!

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Get all the facts. Send for *Aluminum Applications in the Pulp and Paper Industry*, an informative 12-page folder reprinted from *TAPPI*, Vol. 41, No. 4, April, 1958. For your copy, write to Aluminum Company of America, 857-K Alcoa Bldg., Pittsburgh 19, Pennsylvania.

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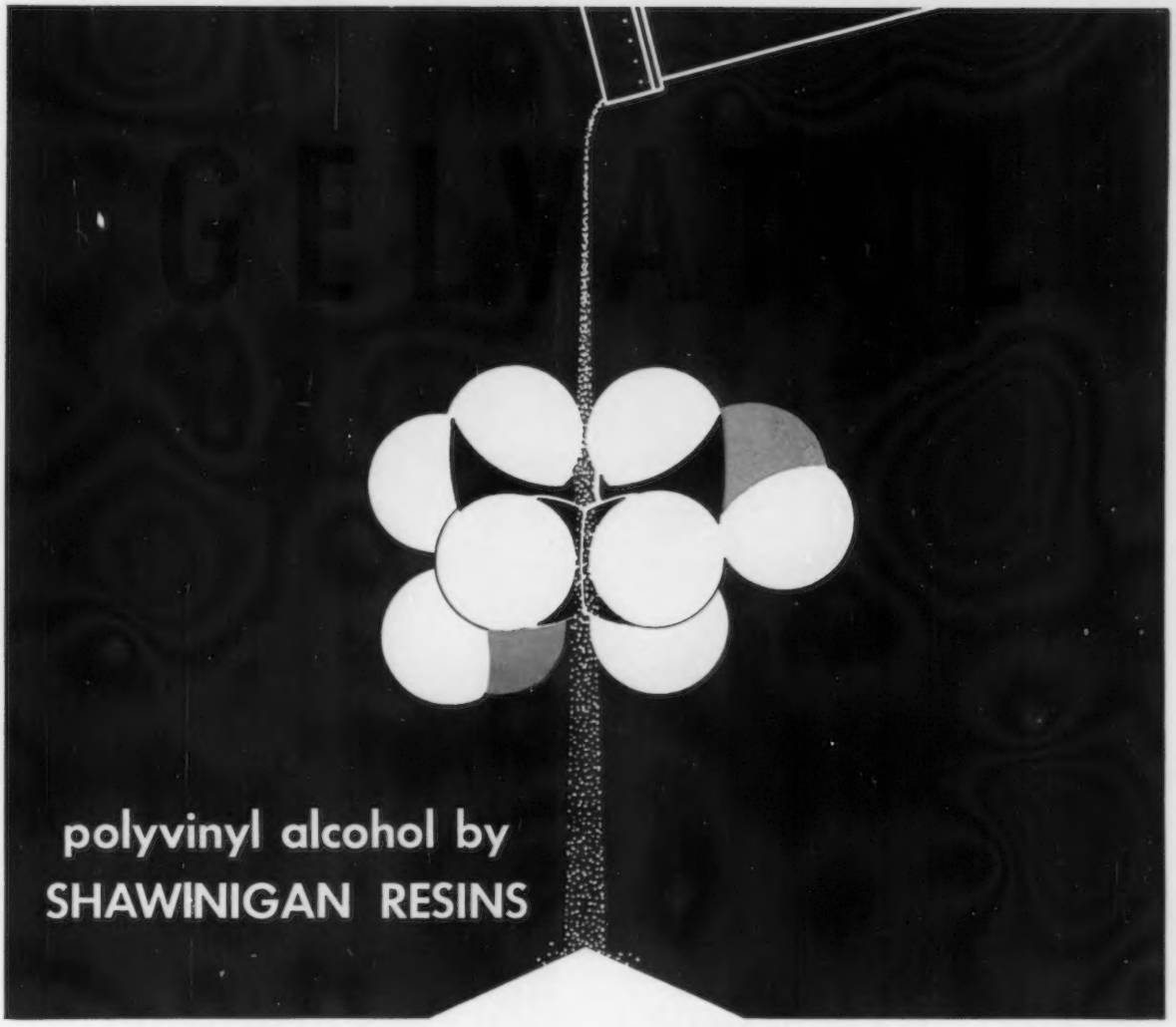

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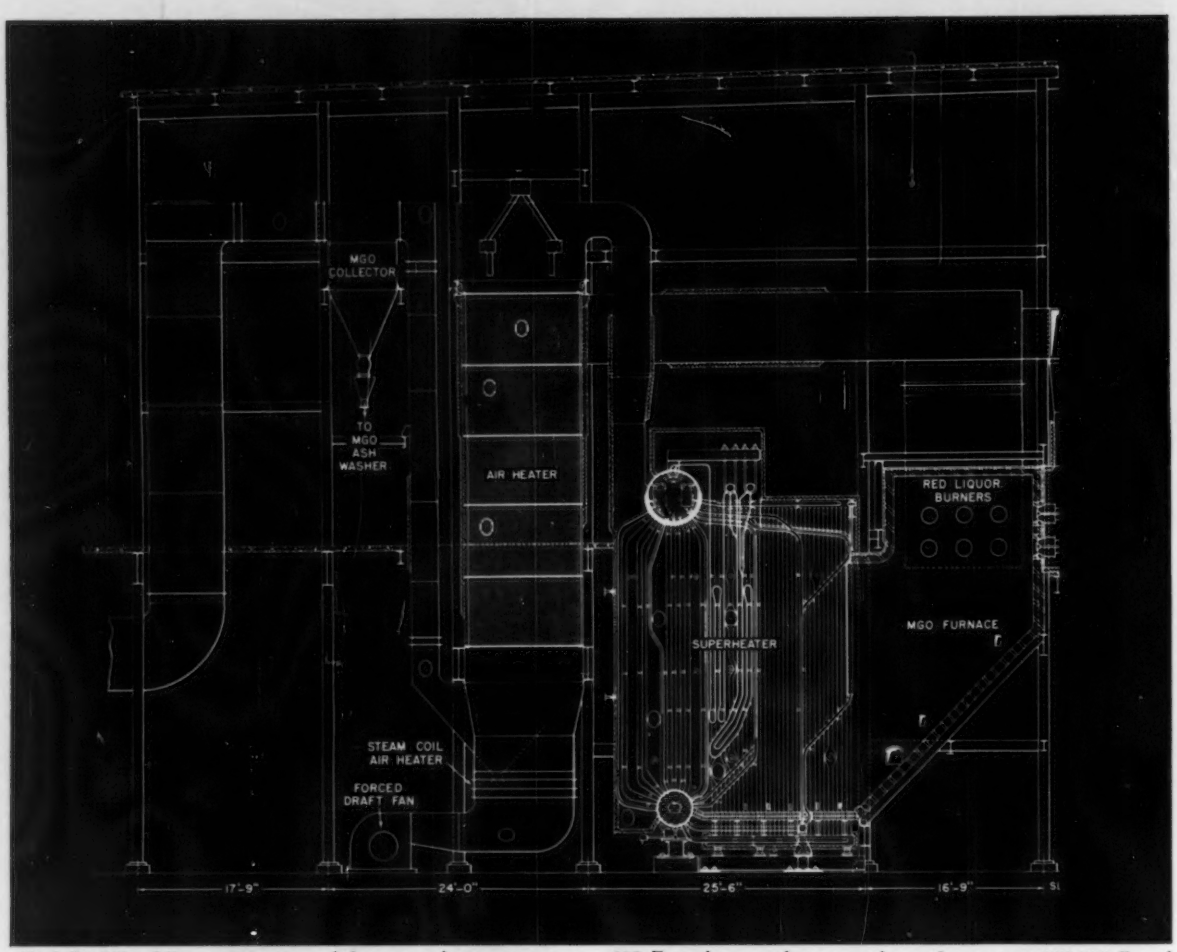

Each B&W red liquor recovery unit has a rated steam generating capacity of 115,000 lbs of steam per hour at 850 psi and 825 F at the superheater outlet and processes 550,000 lbs of red liquor solids per day.

MgO REDUCES POWER COSTS

B&W Recovery Unit Supplies 70% of Steam for Weyerhaeuser's New Sulphite Pulp Mill

Two B&W MgO Recovery Units reduce steam costs at Weyerhaeuser Timber Company's MgO Pulp Mill at Cosmopolis, Washington. These dependable and efficient units generate 13,500 lbs of steam per ton of bleached pulp through the burning of recovered MgO liquor. They have a combined capacity of 230,000 lbs of steam per hour. Additional steam is provided by an oil and bark-fired B&W Boiler.

Reduced steam costs plus low chemical makeup with this simplified recovery system have contributed to the growth of MgO pulping. Start-up of the fifth MgO pulping and recovery installation during 1959 will increase pulp production by this process to 650,000 tons per year.

Whether you're planning a new mill, or thinking in terms of conversion, it will pay you to talk to B&W about heat and chemical recovery. B&W's many years of experience in designing and manufacturing recovery equipment can help you reduce pulping costs and increase profits. Write today for further information. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y. P-816

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Here's a rugged little producer that does a big job — at less cost to you! With a greater capacity than considerably larger jordans, the new Noble & Wood Whippet Jordan *offers high speed production on all grades at a real saving of horsepower.*

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Four Noble & Wood Whippet Jordans installed in a southern tissue mill.

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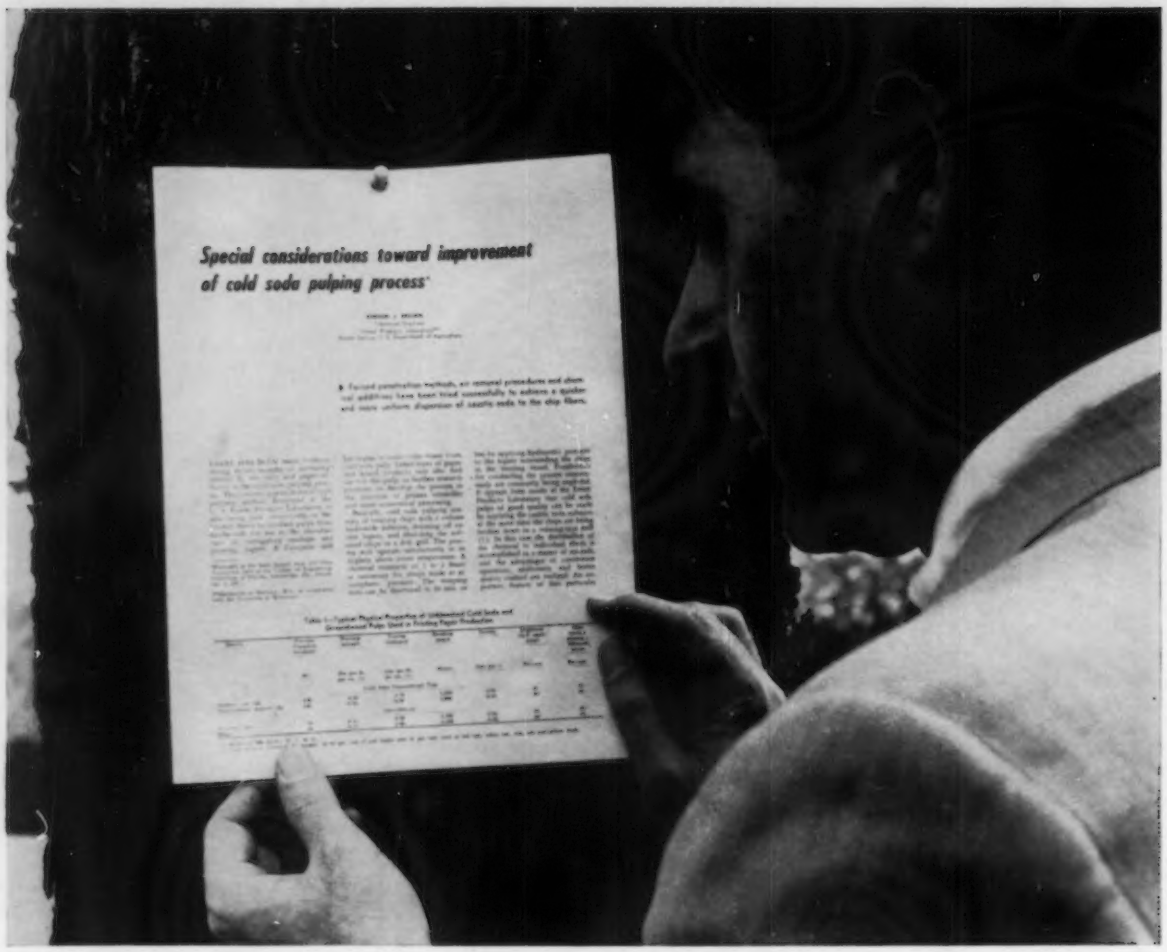

NOTICE

New data on cold caustic steeping of hardwoods

In October of 1956 a bulletin on a new process for treating aspen pulp with cold caustic soda began leaving the Hooker mail room.

This bulletin describes work done under Hooker sponsorship aimed at making it possible for the pulp industry to use cheap and readily available aspen for corrugating board and news-type papers.

Since that time many more developments not under Hooker sponsorship have been made, some of which are presented in a paper recently published in several journals. Believing this would be of value to many people in the industry we have secured a supply of reprints to offer to all interested persons. The title is: *Special Considerations Toward Improvement of Cold Soda Pulping Process**.

This new paper gives results from experimental and practical work with southern red oak, white oak, soft maple, elm, ash, and yellow birch pulps.

It puts particular emphasis on factors which can help you further improve the quality of paper and boards made from these hardwoods. A number of charts and tables summarize data on such liquor absorption factors as pressure, vacuum, particle size, moisture content, surfactants, and presteaming.

To get a copy, just write for Bulletin 252. If you missed the earlier work, ask also for Bulletin 250.

*This is a reprint of a paper prepared by Kenton J. Brown, a chemical engineer of the Forest Products Laboratory, Forest Service, U. S. Department of Agriculture.

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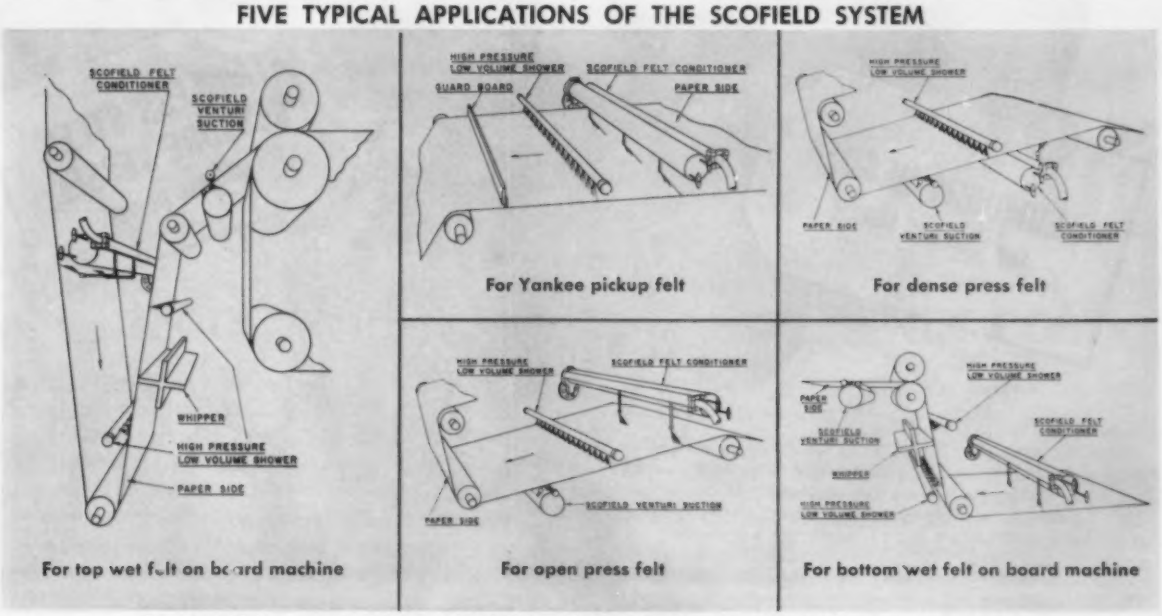
THE SCOFIELD FELT CONDITIONING SYSTEM ASSURES: added felt life increased machine speed lower water consumption ...reduced shut-down time

1 The Scofield FELT CONDITIONER maintains a clean, soft felt. A traveling high-pressure spray of controlled warm water with optimum velocity and density automatically cleans the felt with a minimum use of water.

2 The Scofield HIGH PRESSURE SHOWER is ideal for light to medium cleaning on all wet felts, and for cleaning on cylinder molds and fourdrinier wires. Its unique shape, in section, gives greatest control of velocity, pressure and direction of force.

3 The Scofield VENTURI THROAT SUCTION, using low vacuum, removes dirt, paper fibers and water from all types of wet felts. Round monel bars provide better cleaning action and give a minimum of felt contact to insure longer felt life.

FIVE TYPICAL APPLICATIONS OF THE SCOFIELD SYSTEM



The Scofield System not only cleans the felt but also removes the water absorbed by it, continuously and *across the full* width of the machine.

The angle at which the spray of the Conditioner strikes the felt is determined to suit each installation. Whippers can be "backed off" and squeeze rolls eliminated because of the great dirt-loosening action provided by the Conditioner jets. Write for a free survey of your felt or wire conditioning problems.

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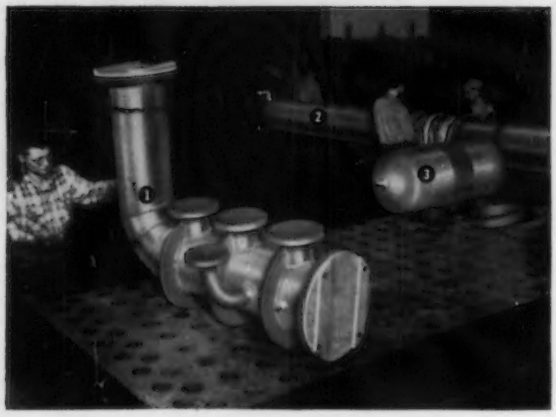

These three jobs are typical of the wide variety of custom piping work which we do for the power and process industries. In the background of the photo welders are shown making the heli-arc root pass on 18" O.D., 3.875" wall, chrome-moly main steam piping. In the foreground, ready for final inspection, is a 12" header for a process operation, fabricated of ⅜" aluminum alloy. The pressure vessel, of austenitic steel, is one of many we produce for atomic energy application. The manufacturing of this type of piping requires specialized facilities . . for engineering, fabricating, testing, assembly, and erection. We have those facilities. Use them on your piping jobs.

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GOOD TIME TO TRIM FAT

from needless caustic soda costs!

Columbia-Southern's experience in manufacturing and selling quality caustic soda convinces us that many caustic users can effect appreciable savings on their current costs. Isn't this the ideal time to see if this applies to your caustic consumption?

Let's take the *form* of caustic you are buying and handling. Are you quite sure that new or projected changes in your products or processing won't be benefited by purchasing liquid, rather than anhydrous? Or vice versa? Or 73% liquid, rather than 50%? Do you have reliable figures on diluting and storing the stronger concentration? How about the facts on completely up-to date unloading techniques and equipment?

How about the uniform *quality* of the caustic you are receiving? Here again, Columbia-Southern can advise you with the authority of recognized experience. As a matter of record, we have led in developing improved tank car linings, heating, insulation, and safety features . . . patented unloading and dilution processes . . . economical waterways delivery.

Our well-grounded Technical Service engineers have helped customers save thousands of dollars in buying and using caustic soda. Isn't it good business, especially *now*, to see what savings they might work out for you? You may request their services either through our Pittsburgh address, or any of the fourteen Columbia-Southern District Sales Offices.

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. . . for size stabilizing
. . . for coating fluidizing
. . . for uniform dyeing

You will find it profitable to get all the facts about Nopcosant —Nopco's newly improved dispersant and solubilizer. Ask your Nopco representative for full details or write for complete information.

Remember, too, back of Nopco paper chemicals stands Nopco technical service—ready to assist with laboratory data and recommendations based upon your specific requirements. Nopco Chemical Company, 60 Park Place, Newark 1, N.J.

Properties of Nopcosant

- A fine powder of uniform particle size
- Dusts less than any other similar product
- Lightest colored product of its type
- One of the most rapidly dissolving products available
- The most nearly neutral *p*H in its chemical class

NOPCO®

VITAL INGREDIENTS
FOR VITAL INDUSTRIES

Plants:
Harrison, N.J. • Richmond, Calif.
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Smidth Rotary Kilns

For Reburning Lime Sludge

We are specialists in the design and manufacture of rotary kilns, coolers and auxiliary equipment for burning lime, lime sludge and for many other purposes.

Over 1,250 Smidth rotary kilns have been furnished all over the world.

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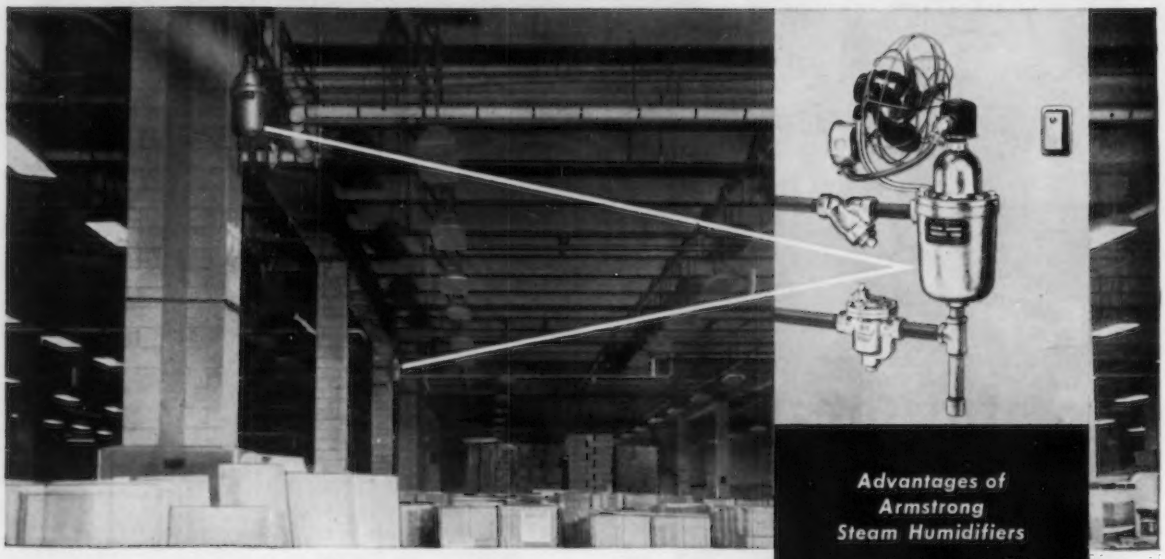
These people have solved dry air problems with Armstrong Humidifiers...you can, too



Here are two of the 29 Armstrong Humidifiers installed at Alford Cartons Division of Continental Paper Company, Ridgefield Park, N.J.

Advantages of Armstrong Steam Humidifiers

• Automatic, Accurate Control • Low Initial Cost • High Capacity • Low Operating Cost • No Mineral "Dust" • No Frequent Cleaning • No Dripping or Dampness • Very Low Maintenance • Easy to Install

PAPER COMPANY

"Armstrong Steam Humidifiers have reduced scrap losses and frequent machine adjustments caused by dry board. Maintenance of the units has been practically nil."

—Alford Cartons Division, Continental Paper Company, Ridgefield Park, N. J.

FURNITURE MANUFACTURER

"By eliminating cracking and checking of wood due to dryness, Armstrong humidifiers save $5000 to $6000 annually."

—Vilas Furniture Co., Ltd., Cowansville, Quebec.

GENERAL OFFICE

"Static caused operating difficulties in business machines. Two Armstrong humidifiers overcame the problem."

—U. S. Rubber Co., Naugatuck, Conn.

LEATHER MANUFACTURER

"Armstrong humidifiers help keep leather soft, stop weight loss, help maintain quality."

—A. F. Gallun and Sons, Milwaukee, Wis.

PRINTING PLANT

"Armstrong humidifiers have eliminated production losses caused by static electricity on printing presses. Humidity was 20%, now 50%."

—Nazarene Publishing Co., Kansas City, Mo.

ENGINEERING OFFICE

"Colds and absenteeism have been reduced since installing Armstrong humidifiers. Before, humidity was 10%, and temperature had to be kept over 75° F. Now, at 40% humidity, comfort is maintained at 70° F."

—Burns & McDonald Engineering Co., Kansas City, Mo.

RUBBER COMPANY

"Because of an explosion hazard, machinery is set to stop when humidity drops below 40%. It has never shut down since Armstrong humidifiers have been on the job."

—U. S. Rubber Co., Indianapolis, Ind.

GET THIS HELPFUL BULLETIN

Bulletin No. 500 answers these questions: How can dry air affect profits? Why must relative humidity be accurately controlled? Why is steam better for humidification? What do users of Armstrong Steam Humidifiers report? How are the units installed? What are the initial and operating costs? What are the sizes and capacities? . . . and many other questions you may have.

To get your copy, just send the coupon, or call your local Armstrong Representative today—there's no obligation.

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(Clip to company letterhead and mail)

805-SH

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WHY THE SNOW LOOKS WHITER HERE

It's the Du Pont Paper White BP in this paper that causes the four-color illustration to reproduce with distinctive vitality.

The "blues" and other colors are heightened, and the "whites" stand out. The lighter colors take on a new brightness. Notice, too, how the higher whiteness of this sheet improves the definition and readability of type matter.

Du Pont Paper White BP can add real distinction and sales appeal to your white papers; it can be applied continuously to the stock, added to the beater, surface applied at the size press or at the calender stack, and added to a coating mix. Du Pont Paper White BP is available as a solution, as a powder and as a concentrated powder.

For full details, write E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Dyes and Chemicals Division, Wilmington 98, Delaware.

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DYES AND CHEMICALS

Better Things for Better Living . . . *through Chemistry*

New survey shows periodical publications read by pulp and paper mill executives in export markets

HOW THE SURVEY WAS CONDUCTED

The Schuyler Hopper Company, market research firm, sent a questionnaire to every rated pulp and paper mill in five countries. Australia, Belgium, Peru, Philippine Islands and Union of South Africa.

Questionnaires and covering letters were in the native language of the country surveyed.

Three basic questions were: What periodical publications do you read that are devoted to the business of making pulp and paper?

What position do you hold in your company?

What languages do you read?

Responses were received from an average of 1.76 people in mills surveyed.

Answers to the question, "What do you read?" mentioned 115 publications. The top 10 are listed in the tabulation opposite.

Titles of respondents indicate managerial, technical or production functions.

MOST MILL PEOPLE IN NON-ENGLISH SPEAKING COUNTRIES READ ENGLISH

It is evident that English is a universal language in mills everywhere. Here's how respondents in countries where English is not the native tongue answered the question, "Do you read English?"

	YES
Philippine Islands	83.3%
Belgium	94.9
Peru	100.0

In markets surveyed, PAPER TRADE JOURNAL offers best overall coverage

Percent Readership of Leading Publications, by Country

(Based on 65% response from all rated mills in 5 countries and an average of 1.76 respondents per mill.)

Publication	Australia	Belgium	Peru	Philippines	Union of S. Africa	All 5 Countries
PAPER TRADE JOURNAL	71.4%	27.8%	80.0%	83.3%	85.2%	55.9%
WORLD'S PAPER TRADE REVIEW	46.4	26.2	20.0	–	70.5	40.2
LA PAPETERIE	–	78.6	–	–	2.9	36.5
TAPPI	57.1	19.6	–	16.6	50.0	34.3
PULP AND PAPER MAGAZINE OF CANADA	57.1	9.8	–	–	29.4	23.8
THE PAPER-MAKER	32.1	31.1	–	–	11.7	23.8
PAPIER, CARTON ET CELLULOSE	–	45.9	60.0	–	–	23.1
DAS PAPIER	7.1	27.8	–	–	5.8	15.6
WOCHENBLATT FUR PAPIERFABRIKATION	–	27.8	–	–	5.8	14.1
THE PAPER INDUSTRY	17.8	3.2	–	50.0	11.7	10.4

The table shows the 10 highest ranking publications as mentioned by respondents from all five countries. In the survey 105 other publications were mentioned, none of which received as much as 10% overall readership . . . and most of which were mentioned by less than 1% of respondents.

Responses for the five countries surveyed show PAPER TRADE JOURNAL to be the strongest publication in South Africa, Peru, the Philippines and Australia.

Among all five countries combined, PAPER TRADE JOURNAL is better read than any other single magazine.

The results of these surveys in five countries, linked with the fact that such a high proportion of respondents read English, could indicate that PAPER TRADE JOURNAL has better coverage in mills all over the world than any other single publication. To equal this world-wide coverage you would have to advertise in a combination of several other magazines.

Paper Trade Journal

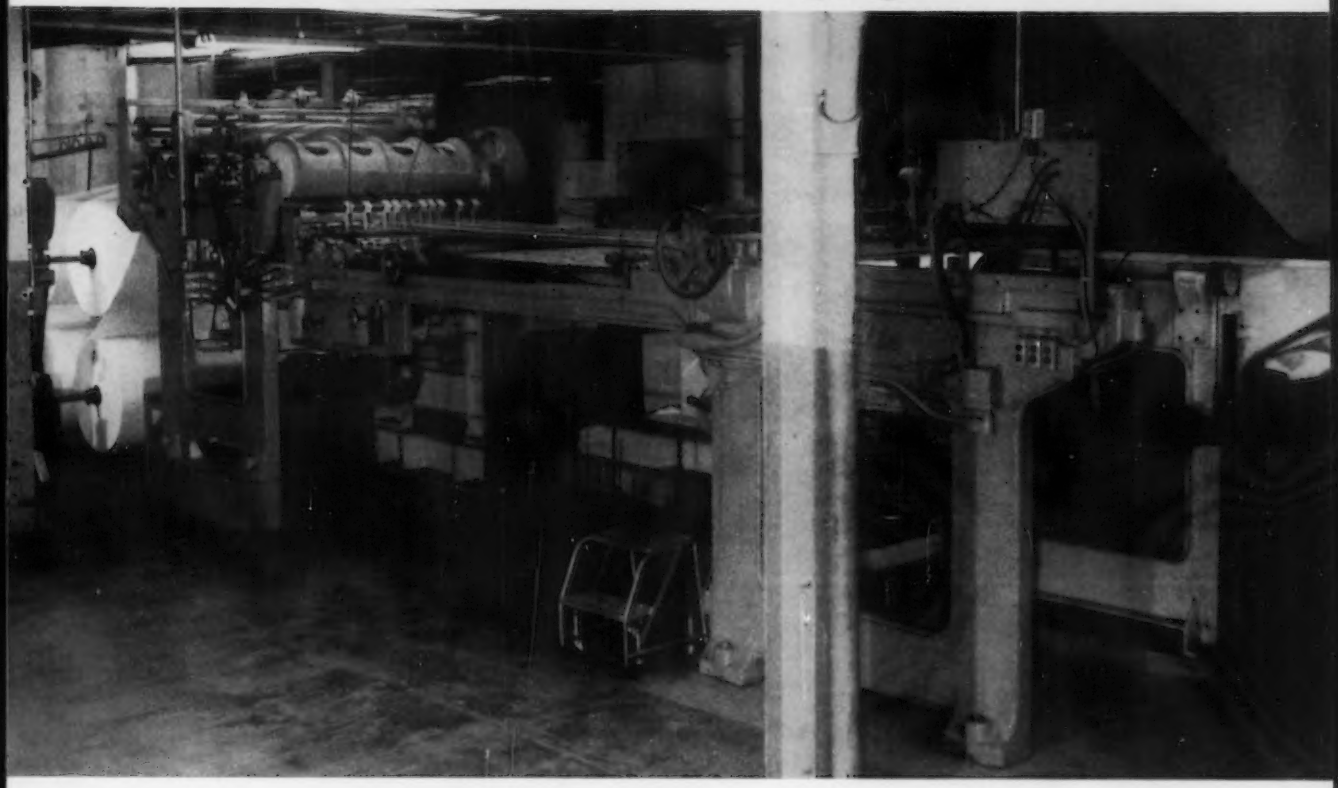
49 West 45th St., New York 36, N. Y.

Representative in United Kingdom
Publishing & Distributing Co., Ltd.
177 Regent Street • London, W. 1 • Tel.: Regent 6534-6535-2361

PAPER TRADE JOURNAL is audited annually by the Audit Bureau of Circulation, New York, U.S.A., which examines, checks and audits circulation records of member publications. Only publications that maintain fully paid subscriptions can be members. Circulation Statement on request.

Clark-Aiken SHEETERS

PRODUCE Savings UP TO 50% BELOW MILL CHARGES



at Whiting-Patterson Company

Mr. R. W. Fishburn, president, Whiting Patterson Company, Philadelphia, Pennsylvania, says:

"With regard to the advantages of our Clark-Aiken sheeter, we would say it has vastly increased our production of sheets over the former equipment we were using.

"We use it exclusively for sheeting of envelope paper which is being sold by the mill at an up-charge of 1½ cents. Under our operation we have been able to save about half of this due to the use of this particular sheeter. In addition it gives us the advantage of being able to have in our operation sheets of many sizes that cut to much better advantage than we could get were we forced to cut from a stock sheet we might happen to have on hand were we buying sheets directly from the mill."

Clark-Aiken machinery can help you cut finishing room costs, too!

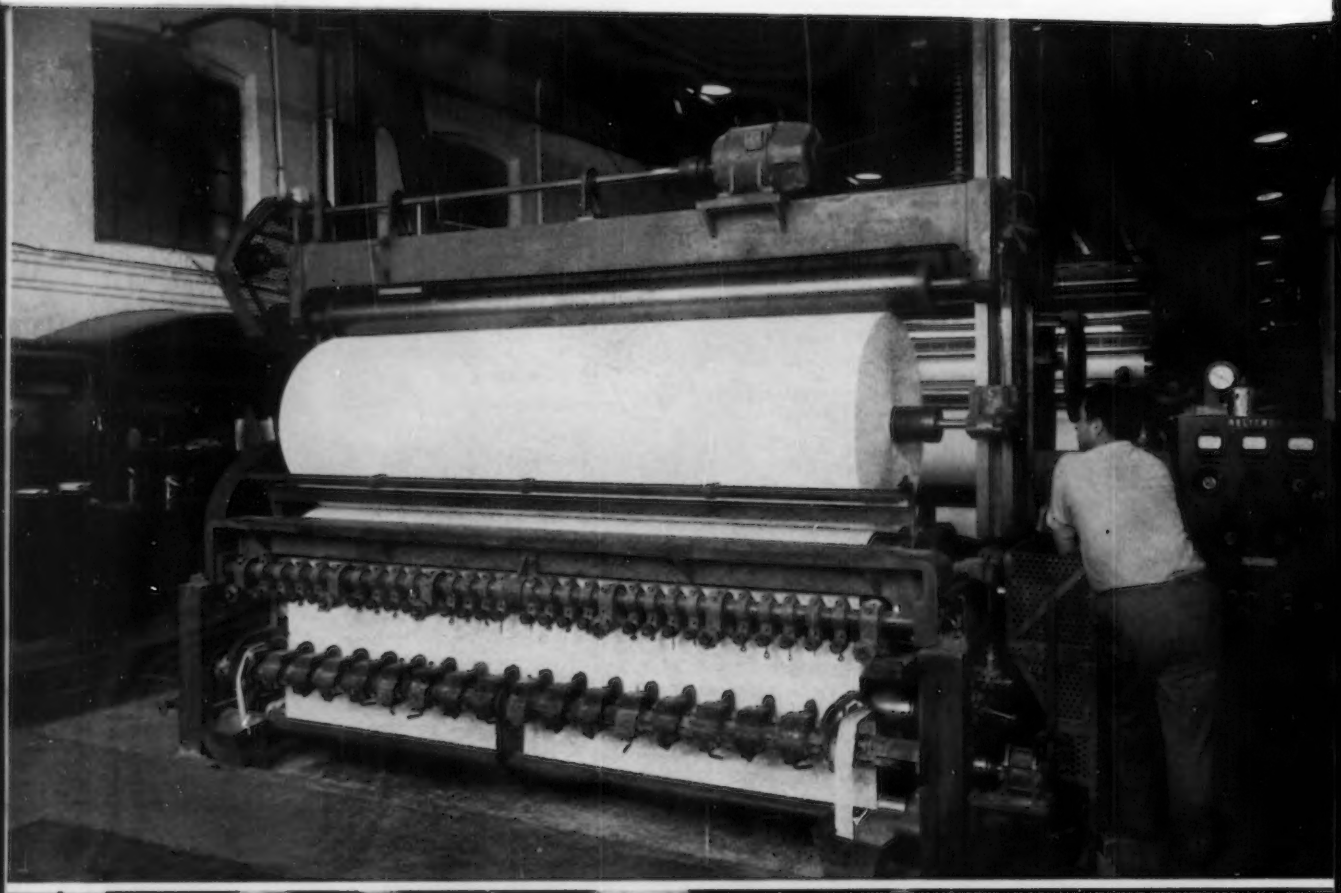
The Whiting-Patterson story of important cost reductions is not unusual where perceptive management utilizes the new concept of practical finishing room automation.

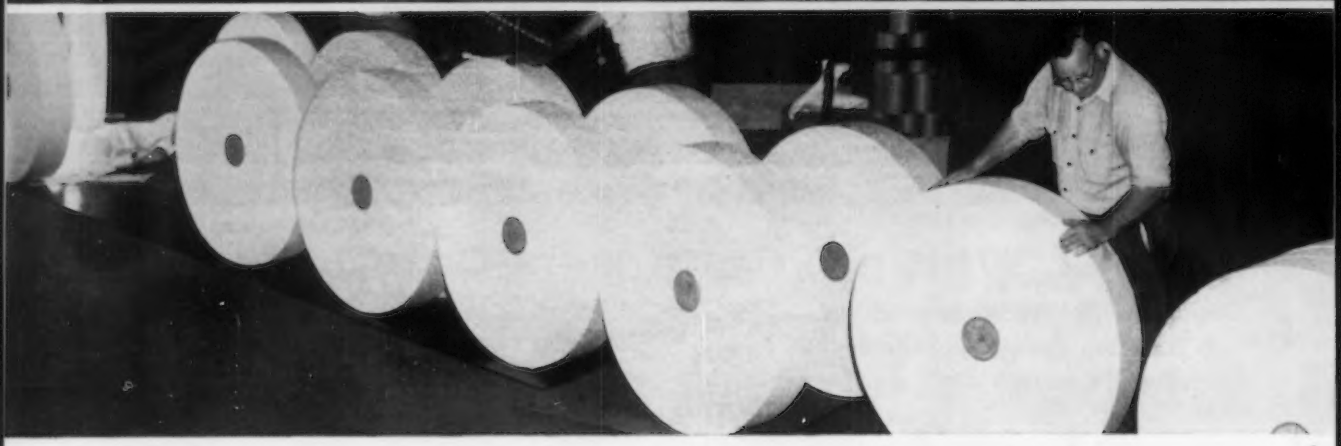
For years paper men have wrestled with the problem of increasing finishing room production while lowering the cost factor. And now Clark-Aiken equipment provides the practical solution to an integrated finishing room that will allow you to take full advantage of your modern equipment including high speed presses. Consult Clark-Aiken engineers and learn how complete automation can solve your production problems.

THE Clark-Aiken COMPANY

956 SPRINGFIELD ROAD

LEE, MASSACHUSETTS





Slit, wound, ready to ship — one operation

These photos show how the Franconia Paper Corporation eliminated a costly rewinding operation.

You're looking at a Kidder 125-inch Master Mill Winder, installed in the Franconia plant as a paper machine slitter-winder nearly three years ago. Since then this high speed, high quality machine has been steadily producing rolls of envelope stock — as narrow as 6 inches, with diameters up to 40 inches — saving time and money every time it goes to work.

If you are producing similar rolls — and still rewinding them as a separate operation — it will pay you to find out how surely and easily you can cut your finishing room costs. Write today to Kidder Press Company, Inc., Dover, N. H. Eastern Sales Office: Empire State Bldg., New York 1, N. Y. Mid-West Sales Office: 400 Washington Bldg., Madison 3, Wis. West Coast Representative: Bojanower Machinery Service Corp., 5270 E. Washington Blvd., Los Angeles 22, California.

Make Good Impressions Faster with

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Trends

Paper and Board Details for August

Paper production in August was 2% below the same month last year and paperboard was 2% above, according to the U.S. Department of Commerce report "Facts for Industry" which provides the first detailed figures on August production. By grades the following papers were off in August compared with a year ago: newsprint, fine, machine coated, wrapping and tissues (other than sanitary). The following papers were ahead: groundwood papers (uncoated), uncoated book, bag (not shipping sack) and sanitary tissues. The following paper boards were ahead: corrugating medium, folding and special paper board stock. Off were: liners, special food board, set-up and wet machine board. Construction papers and boards as a whole were well ahead, with hardboard the only individual grade to be off.

How Long for World Consumption to Double?

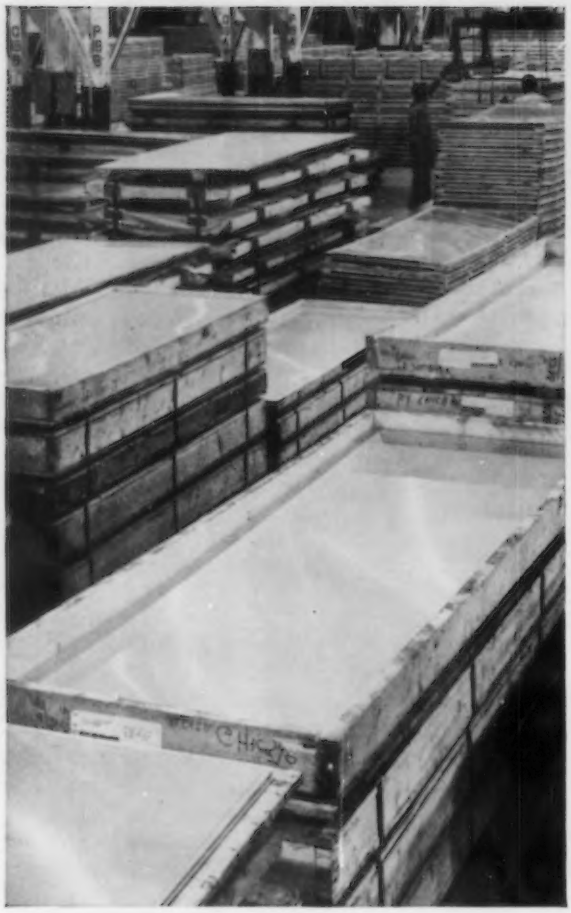
World consumption of pulp and paper products should double in the next eighteen years states the latest forecast of the Food and Agricultural Organization of the U.N. This forecast is based on the assumption that the rate of increase does not exceed a conservative 4% a year. However on the basis of the FAO forecast for 1949 to 1957 this figure is much too conservative. The average rate of increase between 1949 and 1955 was 7.2%, 1956 was 5.1% and last year only 1.6% (due to the recession). This gives an average rate of increase of 6.3% for the last nine years. If this nine year average rate of increase is maintained then world consumption of pulp and paper will double in about twelve years.

New High for Boxes in 1959

"Shipments of corrugated boxes will probably set all-time highs in 1959," Peter W. Hoguet, president, The Econometric Institute, told the 19th annual meeting of Fibre Box Assn. last week. Mr. Hoguet based his forecast on continued expansion of consumer perishable goods industries, which are the largest single market for corrugated boxes, and a sharp upturn in production of consumer durable goods, during 1959. Although shipments of corrugated boxes dropped sharply during the first half of this year, they picked up during the later months and are expected to continue on the uptrend for the balance of this year, he said.

Merchandising and Research Key to Greater Box Sales

The fiber box industry must step up its merchandising and devote more efforts to research and development if it is to continue to grow, Wayne W. Jackson, president of Hoerner Boxes and president of the Fibre Box Assn. told the association's annual meeting. Mr. Jackson pointed out that for the first time in the industry's history competitive packaging was endeavoring to replace the corrugated box. "Zealous merchandising and development of new uses are imperative to offset these attempts to substitute or eliminate our boxes," he declared. Elastic paper, waterproof board and new printing techniques are among the new developments which have recently come from industry research, but more are needed, Mr. Jackson said. "Our industry cannot be complacent, standing on our past achievements if we are to survive," he concluded.



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WHICH ONE SOLVES YOUR CORROSION PROBLEMS BEST?

Ryerson offers both these corrosion fighters

Where high pressure and high temperatures demand *high-strength steel*, stainless is the overwhelming choice. And when you need stainless, look to Ryerson—with 2351 kinds and sizes of sheets, plates, bars, tubing, pipe and fittings in stock. In addition, our cutting equipment is unexcelled. For example, we can cut plates up to 12′ x 25′ absolutely square on our abrasive disc saw and accurately flame-cut intricate shapes.

On many other applications the best answer to your corrosion problem may be plastic, Ryertex®-Omicron PVC (polyvinyl chloride). Exclusive from Ryerson, this lightweight, rigid plastic licks more than 280 corrosive liquids and gases. It has been successfully used, when properly installed, at operating temperatures up to 212° F. Chemically inert, PVC imparts no odors or tastes; resists weathering, rotting and "aging." Non-sparking and nonmagnetic. Offered in pipe and fittings, sheets, rods, and fabricated parts.

A Ryerson specialist will gladly give you all the facts about both these anticorrosive materials—and about Ryerson's immediate service that meets your exact requirements. Call your nearby Ryerson plant today.

INDUSTRIAL PLASTICS AND BEARINGS DIVISION

RYERSON STEEL®

Member of the INLAND Steel Family

Other Products: Ryertex-Omicron PVC pipe and fittings, sheets and rods • Babbitt metal • aluminum • carbon, alloy and stainless steel in every type, shape and size • metalworking machinery, etc.

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Wrenn Paper and Mead to Merge

A plan for merger of the Wrenn Paper Co. of Middletown, Ohio, with the Mead Corp. was disclosed recently. It is reported the transaction will involve an outlay of more than $3 million by Mead.

A spokesman for Mead said an agreement for the acquisition of the total assets of Wrenn has been concluded, subject to Wrenn shareholder approval. He also said that it will be operated as a wholly-owned subsidiary of Mead under present management. No personnel changes are contemplated.

Calvin Verity, Wrenn board chairman, notified shareholders in a letter that the proposal had been adopted by the board.

The plan, he said, calls for all assets of the Wrenn Co. to be transferred to a subsidiary to be selected by Mead. In return Mead would turn over 75,375 shares of its common stock to Wrenn shareholders on a basis of three shares of Mead stock for four of Wrenn.

The Wrenn Paper Co. produces impregnating and saturating papers and absorbent specialties at the rate of about 25 tons per day. Mill equipment includes beating and refining equipment and an 84-inch fourdrinier.

Printer Planning Deinking Plant

Pacific Press Inc., of Los Angeles, California are investigating a deinking plant for its own waste paper. This was learned by *Paper Trade JOURNAL* at the recent Deinking Conference. The proposed deinking mill would be the first such plant operated by a large printing house. Pacific Press, is now completing studies which will in all likelihood lead to the installation of a deinking operation at the Los Angeles printing plant.

The deinking plant will probably utilize the froth flotation method. The proposed deinking mill would "do light washing and use other media of ink removal." Plans call for complete deinking and bleaching at Pacific Press. It is contemplated shipping the deinked pulp in lap form to local pulp consumers. The installation of a deinking plant with 50 tons per day capacity is being considered.

Pacific Press now buries a large tonnage of its waste papers. Prime motivation for installing the deinking mill is Pacific Press' desire to maintain the value of its waste papers. In effect, the company "is tired of waste paper price fluctuations."

A deinking plant at Pacific Press would be the first instance in the country where a printer completely processes his own waste paper. "We believe that there will eventually be no market for waste paper bales as we know them today but that there will always be a market for secondary fiber" said John Brown of the company.

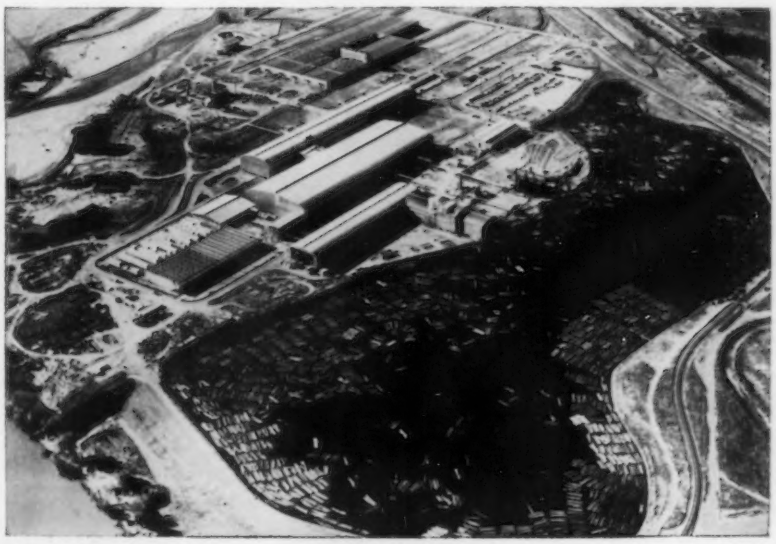
Union and Great Northern in Contract Talk

Representatives of the Great Northern Paper Co. and an employees' union entered contract negotiations in Bangor October 14th in the face of a strike threat.

The president of Local 12, Pulp Sulphite and Paper Mill Workers, said pulp workers representing some 52 per cent of personnel at the firm's Millinocket plant have voted overwhelmingly in favor of a strike if a settlement is not reached. Of 458 votes cast at a meeting, 443 favored strike action, it was reported.

Workers at the GNP plant in East Millinocket were not involved.

The local president said he was instructed by union membership which called for the strike vote not to reveal the contract terms the union seeks at the October 14th meeting. Employees have been working since May 1 on an extension of a contract which normally expired on that date.



Diamond Gardner $25 Million Plant

New Diamond Gardner integrated forest products center at Red Bluff, California, dedicated on Friday, October 10. The plant, which cost over $25 million, has an annual capacity of 90,000,000 board feet of finished lumber and about 30,000 tons of molded pulp products, made from groundwood produced in the new pulp mill there. Log pond in the foreground is 42 acres in area.

New Mill of Panamericana Textile, SA in Mogi Guacu, Brazil

Brazil's first completely integrated bleached kraft mill being built in collaboration with Champion Paper & Fibre Co. The plant will have its own power generating station as well as chlorine and caustic plant. It is scheduled to start-up next year. Consulting engineers for the project are Stadler, Hurter Co., Montreal.

Simpson Rebuilding No. 3 at Everett, Wash.

Complete rebuilding of Simpson Paper Co.'s 150-inch No. 3 paper machine at Everett is under way to permit higher speeds and increase paper production 30 per cent. An improvement in the reclamation system for white water for re-use on the paper machines will increase fiber recovery and lower demand for additional fresh water. The mill's waste paper plant is being enlarged to double the capacity. The three million dollar program will take seven weeks, during which time the paper machine will be out of production.

New Production Editor

With this issue of Paper Trade Journal we welcome a new managing editor, Mrs. Victoria B. Hawkins. A college major in English and Art, she has had broad experience on all sides of journalism and comes to us from a monthly business magazine. As managing editor, Mrs. Hawkins will be responsible for all aspects of the physical production and presentation of the editorial contents. We hope that with the assistance of our presentation consultant, Walter Benz, she will make Paper Trade Journal even more attractive and readable than it has been.

Strike Continues at Whippany's Durham Mill

A strike at the Durham, Pa. plant of Whippany Paper Board Co. near Riegelsville, continues with no sign of settlement reported.

The working force of 90 men walked out on September 26th when a company union contract expired. The plant is being picketed by union members.

The workers, represented by Local 409, United Papermakers and Paperworkers of America, reportedly seek wage increases to put their salary scale on a level with paperboard workers in New Jersey.

Another issue in the strike is a company proposal to cut vacation pay from a 56-hour to a 48-hour basis.

Carolina belles decorate the scene at dedication ceremonies for Riegel Paper Corp.'s newest paper machine, the "Carolina Belle" in background. The ceremonies took place at Acme, N. C. on Oct. 8th. Present were (standing, from left to right): A. P. Mitchell, senior vice president sales; J. L. Riegel, chairman of board and president; Miss North Carolina; Governor Hodges of North Carolina; F. S. Leinbach, vice president and general sales manager; and C. E. Hartford, vice president and manager of Riegel's Carolina division.

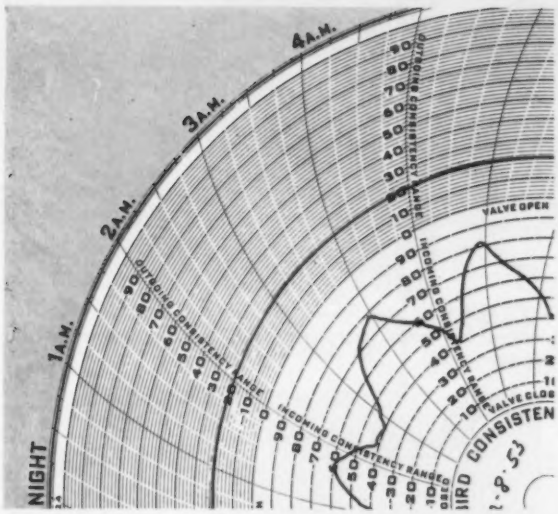
Paper and Board Production

According to the American Paper and Pulp Assn., the ratio of the United States production to mill capacity for the week ending October 4, 1958, was 89.9 per cent compared with 92.8 per cent revised for the preceding week. The ratio was 92.7 per cent for the corresponding week a year ago.

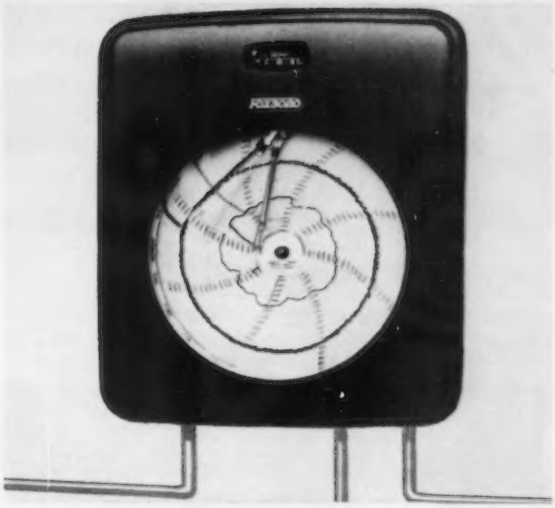
The paperboard production ratio for the week ending October 4, 1958, was 95 per cent compared with 94 per cent for the preceding week and 97 per cent for the corresponding week last year.

(Detailed statistics on page 57.)

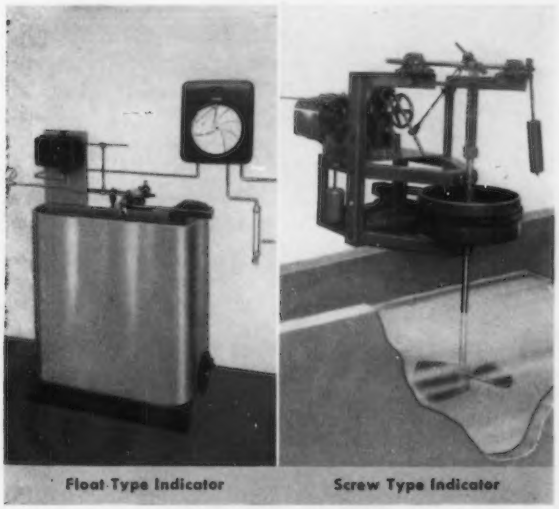
Good Reasons for Standardizing on The BIRD CONSISTENCY REGULATOR



24-Hour Chart Record. The Bird Consistency Regulator provides a 24-hour chart record of both incoming and outgoing consistencies — a constant check on performance and positive proof that stock is neither overweight nor underweight.

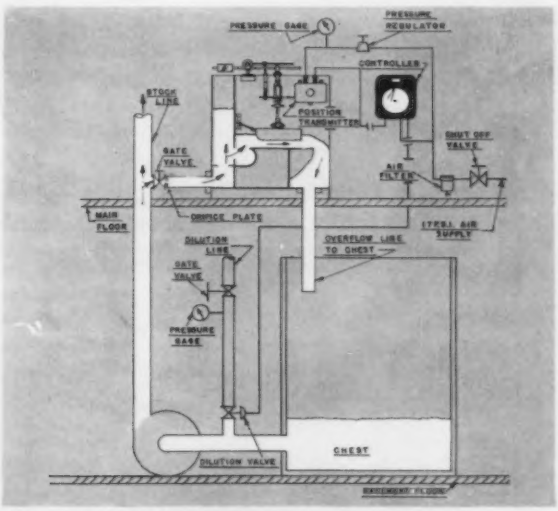


Convenient Control. With the Bird Consistency Regulator, the recorder-controller may be located wherever it is most convenient for the operator. Adjustment in consistency may be made at the controller simply by turning a knob.



Float Type Indicator — Screw Type Indicator

Wide Range. The Bird Consistency Regulator is engineered to handle consistencies from 0.5% to as high as 8% and to handle any flow of stock from less than 50 GPM up to 5000 GPM. Available with mechanical as well as pneumatic control.



Expert Application Engineering. Every Bird Regulator installation is individually engineered by experts to provide accurate, dependable consistency control, under the specific conditions of tonnage, consistency and dilution water pressure.

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

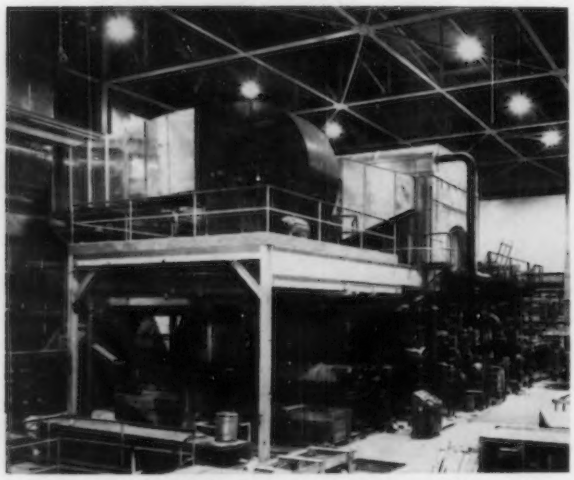
REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON • ATLANTA 9, GEORGIA

Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

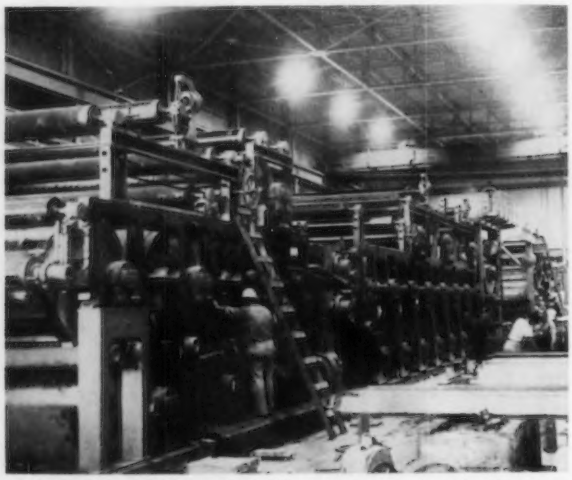
Preview of Naheola

Marathon Southern's new pulp and paper mill at Naheola, Ala., which began trial operations early this fall now is producing bleached hardwood and softwood pulps. A Yankee paper machine is in operation on tissue and toweling grades and a pulp machine is drying pulp for shipment. A multi-purpose fourdrinier to produce paper and light weight boards with a 186 inch trim is now in the final stages of erection.

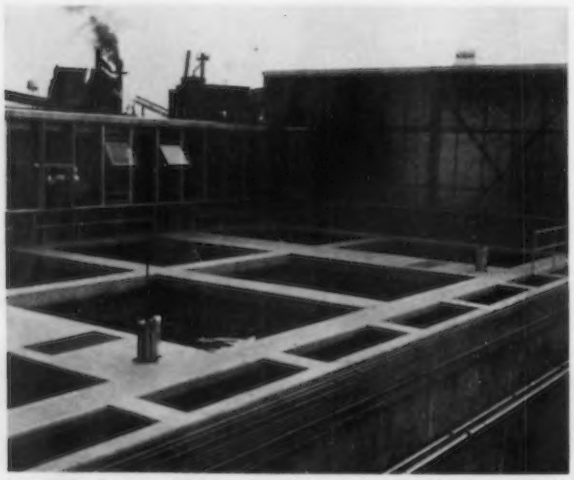
WATER CLARIFIER—Water from Tombigbee River here enters for initial processing before filtration through sand beds.



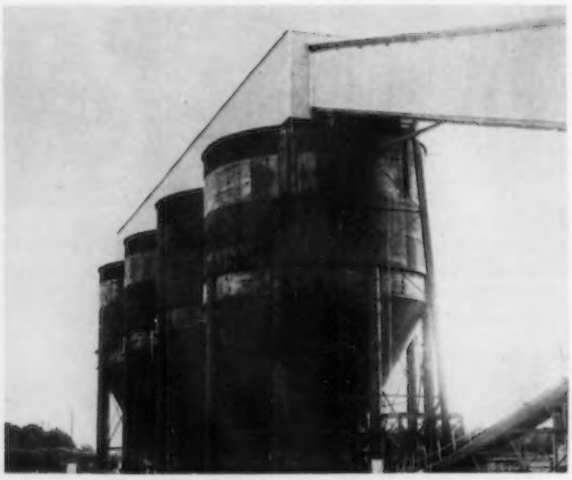
YANKEE MACHINE—During installation. This machine which produces tissue for Northern Products is now in operation.



MULTI-PURPOSE MACHINE—Now entering final stages of erection. Will produce paper, paperboard with 186 inch trim.



WATER FILTER BEDS—Six filter beds mark final step in water purification. Daily capacity: 25 million gallons.



FOUR STEEL BINS—Provide storage for chips in departure from conventional type of concrete silo design.

The DRAPER Felt
DRAPER BROTHERS COMPANY
CANTON, MASS.

J. E. Davis

J. E. Davis Chief Ind'l Engineer at Brown

John E. Davis of Bristol, R. I., was recently appointed chief industrial engineer at Brown Company, N. H., manufacturer of pulp, paper and other forest products. For 18 years Mr. Davis was associated with Botany Mills, Inc., Passaic, N. J., and more recently, as assistant manager and head of industrial engineering department of Cobar Industries, Inc., Bristol, R. I.

Diehl Promoted at Sonoco

James Diehl of Sonoco Products, Hartsville, S. C., engineering department has received a recent promotion to the position of technical assistant to superintendent of power. The promotion was announced by L. A. Turnage, superintendent of power. Mr. Diehl is a graduate of the School of Engineering of the North Carolina State College. He came to Sonoco in the engineering department in August 1950.

T. Flanagan

C. Skinner

KVP Division Head To Retire

Clifford Skinner, Superintendent of the Wax Division of the KVP Co., has announced his plans to retire from the KVP Co., effective next March 1. When he retires, Mr. Skinner will have completed 36 years with the company, all of it in the Wax Division. He became superintendent in 1948.

Thomas Flanagan has been promoted from Assistant Superintendent of the Printing Division to Assistant Superintendent of the Wax Division. He will move up to the position of Wax Division Superintendent upon Mr. Skinner's retirement.

Mr. Flanagan joined KVP as a laboratory chemist. Several years later, he transferred to KVP's Espanola mill in Canada. In 1955, he returned to the parchment plant as technical assistant to the manager of manufacturing.

Also promoted by the company was Aarend Stoppelberg. Mr. Stoppelberg will become assistant to printing division superintendent, Dellmore Moffett. Mr. Stoppelberg joined KVP in 1945 and has been in the printing division since employment.

Sutherland Appoints Rumberger Managers

The appointment has been made of George Rumberger as manager of fundamental research for Sutherland Paper Co., Kalamazoo, Mich.

Mr. Rumberger has done considerable research work in paper converting, and holds numerous patents in this field.

Mortell to N.Y. Mill

Leo G. Mortell, former west coast sales representative for the Nekoosa-Edwards Paper Co., Inc., Port Edwards, has been named sales coordinator for the firm's Potsdam, N. Y., mill.

He will be responsible for liaison work between the New York sales office and the main office order department.

Mr. Mortell joined the company in 1949.

E. G. Williams Elected to Board

Ernest G. Williams, vice president of the First National Bank of Tuscaloosa, Ala., has been elected to the board of directors of the Gulf States Paper Corporation.

H. U-Scharin

New Merrimac Production Manager

Merrimac Paper Co. announces the appointment of Hans U-Scharin as production manager of its facilities in Lawrence, Massachusetts. Mr. Scharin has had experience in the paper industry, both in Sweden and the United States.

Mr. Scharin is a graduate of the Technical Institute of Stockholm in 1944 with degree in mechanical engineering, and pulp and paper degree from N. K. I. Institute of Stockholm in 1946. He has been employed by A. B. Scharins Soner and A. B. Defibrator in Stockholm, Sweden; American Defibrator, Inc., New York; The Ruberoid Co., Gloucester City, N. J., and resigned as plant manager of A. & P. Corrugated Box Corp., Lawrence, Massachusetts, to start his duties with Merrimac on October 6, 1958.

Kila Succeeds Crumpler at Thomson

Thomson Paper Mills Inc. President Nat E. Heit has announced the appointment of John H. Kila, Hudson Falls, as acting manager of the company's Thomson tissue mill, succeeding Stanley Crumpler of Saratoga Springs, until recently the company's manager there. Mr. Crumpler is no longer associated with the company.

Mr. Kila, after service as a paper machine designer and sales engineer in Holland, Belgium and Luxembourg, became mill engineer and assistant mechanical superintendent for K. V. P. company at Espanola, Canada, in 1951. From 1955 to 1957 he was project engineer for Kruger Engineering Co., Ltd. From 1957 to June 1958 he was chief engineer for Osborne Paper Mill Equipment Corp., of Fulton, N. Y. Since June 1958 he has been associated with Thomson Paper Mills in modernizing its papermaking machinery and mill at Thomson.

Ludlow Closes Brookfield Plant

Ludlow Papers, Inc., has announced that it is closing its Brookfield, Mass. plant and transferring operations to its larger quarters in Ware, Mass.

The closing of the Brookfield plant had been rumored for some time, and was confirmed by a company spokesman.

At the same time the company announced that it is building an addition to its local installation to house equipment which will be transferred from Brookfield.

The company's present plans call for the erection of a new building to contain sales offices and some manufacturing laboratory and warehouse facilities. Exact details as to the size and the date of the groundbreaking have yet to be decided.

Barger Purchases Plant

Ralf M. Welch, president of Barger Box and Printing Corp., has announced the purchase of the former Faries-McMeekan plant.

Mr. Welch said the 80 by 210 foot plant would be used for general offices, folding carton manufacturing and printing operations. Set-up box manufacturing will continue at the West Beardsley plant.

The move is expected to be completed within the next two weeks.

The combined sites total 52,000 square feet. The firm plans to construct additional manufacturing facilities in the near future.

Flexographic Assn Formed

An organizational meeting of the newly formed Flexographic Technical Association was held recently at the Biltmore Hotel on Sept. 26, at which time officers of the Association were elected, and 18 board members were chosen. Other activities during the day-long session included approval of a constitution and by-laws, a luncheon, and discussions of some of the technical problems faced by the industry. More than 100 attended.

The new officers are: Karl L. Weik, Cello-Foil Products, Battle Creek, Mich., president; Frank Longenecker, Simplex Paper Box Co., Lancaster, Pa., and Franklin Moss, Mosstype Corp., Waldwick, N. J., vice presidents; Douglas E. Tuttle, Interchemical Corp., N. Y., secretary; and Sidney S. Shapiro, Bensing Bros. & Deeney, Phila., Pa., treasurer.

Chairman Franklin Moss presided during the meeting, and said that it was gratifying to find so many who recognized the need for a flexographic technical association. "The FTA's technological efforts will augment the work of other associations," Mr. Moss said, "and FTA will furnish the missing link, as well as cover all flexographic printing—whether on cellophane, or on floor tile." He added that some of the possible projects of the Association might include studies, tests, and research on standardization of materials, supplies, and techniques, plus gathering and evaluating a host of technical information pertinent to the flexographic industry as a whole. "FTA's work can widen the use of flexography," he said.

A step in the direction of problem study and solving was the formation of a technical committee on printing, headed by Frank Brey; on machinery and equipment headed by Robert Zuckerman; and supplies and materials headed by A. R. Bradie.

The next meeting of the Association will be announced later and is to be held prior to February 15 of the coming year. Membership inquiries should be directed to Douglas E. Tuttle, Interchemical Corp., 67 West 44th St., New York 36, N. Y.

Senior Promotions by New Haven Board

Three promotions were announced by New Haven Board and Carton Co.

T. M. Donovan has been appointed director of manufacturing operations; B. A. Gaffney, divisional vice president, New Haven Division, and F. W. Judge, divisional vice president, board mill operations.

Mr. Donovan, formerly with General Motors, joined the Bartgis Division of the company in 1945 and at the time of his promotion was divisional controller of the local plant.

Mr. Gaffney has been with the company since 1943 and is presently serv-

ing as both general plant manager and divisional vice president of the New Haven Division.

Mr. Judge, who joined the company in 1921, will be responsible in his new position for board mill operations both in Maryland and in New Haven.

W. G. Palmer, resident general plant manager and divisional vice president of the company's Bartgis operation, will continue in that capacity.

Division of St. Joe Opens New Plant

The Houston Container Division of the St. Joe Paper Co., destroyed by fire in January, 1957, is back in business. The new plant is on the same site as the one that was destroyed by fire.

The building contains a large two-story area for administrative offices, and a long one-story area for manufacturing, unloading and shipping.

The plant's main function is the manufacturing of corrugated boxes and shipping containers.

The division is especially proud of its large high-speed corrugator, which is capable of corrugating 85-inch wide stock rolls at the speed of 500 feet a minute.

For rapid loading and shipping, a rail siding extends along one side of the building. In the rear of the building, there are 14 truck spaces for incoming and outgoing shipments.

The company first established its Houston division in a relatively small structure alongside the Houston Ship Channel.

In 1949, the company moved to northwest Houston on N. Post Oak Rd., the quarters it occupied until the fire.

L. W. Trapp, Jr., general manager, explained that the St. Joe Paper Co., with its main manufacturing plant in St. Joe, Fla., is a completely integrated, independent company.

"We grow our own timber and make the pulp and paper that is used in the manufacture of corrugated containers."

The company, he said, is owned by the estate of Alfred I. DuPont. Profits are used for charitable purposes.

Container Corp. Names Crandall

Louis M. Crandall has been named plant manager of Container Corp. of America's Malt Ave. plant in Los Angeles.

Mr. Crandall joined Container Corp. in 1946, became assistant to vice president in 1950 and assistant plant manager at the company's Ogden Avenue, Chicago, shipping container plant in 1954.

Great Western to Make Paper Products

Great Western Bag Corp., a subsidiary of Murray Paper Corp. of Los Angeles, will begin manufacturing paper bags and other paper products about Dec. 1, it was announced by Murray Grubman, president of Murray Paper.

A $2,000,000 expansion program is under way in the Vermon district, Mr. Grubman said, with modern highspeed bag making equipment to be installed by November.

Hallmark Names Hughes to New Post

David H. Hughes has been named to the newly created position of executive assistant of Hallmark Cards and will function in a staff capacity, working on special assignments for the president and executive vice-president of the company.

Before accepting his present position, Mr. Hughes was associated with Herbert V. Jones & Co. and earlier served as assistant to the president of Midwest Research Institute.

Hoerner Names Sioux Falls Manager

John Pojunos has been named manager of the Sioux Falls, South Dakota plant of Hoerner Boxes, Inc.

Mr. Pojunos has spent a total of twelve years in the corrugated box industry. He has worked for Hoerner at Sioux Falls four and one-half years, and was in Omaha and Sioux City with Container Corp. of America for seven and one-half years. He succeeds Fred T. Mills, who is retiring from business.

Wilson Jones Sell Calendar Div.

Wilson Jones Co., loose-leaf products manufacturer, announced that its Defiance calendar division has been sold to Keith Clark, Inc., desk calendar producer.

Management Changes At Sorg

The following management changes have been made at Sorg Paper Co.:

M. A. Dawson, manager of merchant sales, became general sales manager; D. T. Dineen, formerly advertising and market research manager, was made market research manager; R. R. Wilhelm, merchant sales representative, became advertising and promotion manager; and F. J. Hoffmann, commercial development manager of converted grades became sales development product manager.

John W. Lacey

Lacey Joins Portco

Addition of John W. Lacey to the sales department of Portco, paper and plastic division, Vancouver, Wash., is announced by Edward H. Look, vice president in charge of sales.

Mr. Lacey comes to Portco from Waxide division of Crown-Zellerbach. He previously was with Bartram Paper Co. of Vancouver, B. C. and later manager of Millprint's Northwest plant.

Mr. Lacey will serve as the sales department's liaison representative with the production department to expedite Portco's service to the expanding market for their products.

Portco produces custom-engineered bags, covers and liners of paper and plastic, paper twines and plastic pipe for Western industry and agriculture.

Manager of A & P Board Mill Named

Mr. Sheldon Appel, executive vice president of A & P Corrugated Box Corp. announced the appointment of Robert J. Brown as mill manager of the board mill division. Mr. Brown was formerly vice president of the Atlantic Board & Carton Corp. of New Bedford, Mass.

Sears Director for Scott

Roderick H. Sears has been named director of purchases by Scott Paper Company.

Mr. Sears joined Scott in 1936 gaining experience first in sales and then in the financial department. Later he worked in the production division at the Chester plant and in 1946 was named plant superintendent in Hoboken. He subsequently served as plant manager at South Glens Falls, N. Y., and Marinette, Wisc., and since 1956 had served as manager of the Fort Edward, N. Y., plant with additional responsibility for the company's facilities in nearby South Glens Falls, N. Y.

Starches for Coating Adhesives

Special types have been developed for high solids work in on-the-machine coating, as well as for medium and low solids binders for conversion and size press applications.

Claude H. Fletcher
Corn Products Co.

Increased machine speeds and heavier coat weights, together with improvements in coating methods, have stimulated research and development in both the paper coating and starch manufacturing industries. As a result, a much wider variety of starches has been made available in recent years for coating binder usage.

Methods of applying the pigmented coating to the paper generally fall into two broad classifications: on-the-paper-machine application and off-the-machine operation, sometimes referred to as conversion coating. According to a recent estimate, in the year 1957 some 1,800,000 tons were coated on the machine and about 1,000,000 tons by conversion coating.

Since these two procedures require different types of starch, they will be considered separately. In general, on-the-machine coating uses a high solids coating made from starches for enzyme conversion in the coating mill. The off-the-machine operation employs a medium solids coating for which the oxidized and ethylene oxide starches are eminently suited. The latter types are also used in low solids coating applied at the machine size press.

High Solids Coating

The first type of coating discussed will be the use of starch for high solids work in the on-the-paper-machine coaters, commonly referred to as the printing press type roll applicators. The high solids coating process should not be confused with another type of on-the-paper-machine coating, namely size press applications. The size press coating work is done with low solids coating formulations and will be discussed later in this paper.

Coating solids of from 58 to 63 per cent are necessary in the printing press type multi-roll coater because of the heavy coat weight applied. In many cases, coat weights of up to 10-12 pounds (25x38-500) are applied to each side of the paper in order to get the best possible coated surface for printability. This would be impossible with the present paper machine speeds of from 1400-1700 feet per minute unless the coating formulation was of high solids.

The higher solids are also necessary in order that this coat weight may be properly dried after it leaves the machine coater and comes in contact with the next section of dryers. At higher paper machine speeds, the coating must contain as little water as possible so that the coated sheet is dry after it has passed over the limited drying capacity of the paper machine.

While casein has been widely used in the past as the binder in machine coatings, and is still being used, most machine coated paper is now made with starch as the adhesive. Starch fulfills the requirements for a high solids adhesive in the coating slip, which is necessary for the production of machine coated paper. The fact that coated papers with starch adhesives could be dried on the machine dryers with a minimum of trouble compared with casein coated papers did much to aid and accelerate the machine coating process.

Common Starches Must Be Modified

Ordinary starches, however, cannot be used for coating binders in the form in which they are received from the starch manufacturer. In that form they possess gelation characteristics which make it impossible to use them in high solids, as they do not have good flow properties.

For this reason, starches used in machine coating must be further converted or modified to give them the necessary flow properties. This is done with the use of a liquefying enzyme in the coating mill. After this treatment, the starch can be cooked at from 30 to 35 per cent solids and be compatible with coating slip solids from 58 to 63 per cent.

Enzyme converted starches have been used for many years in these coatings because of (1) their attractive base coat, (2) the fundamental soundness of the starch converting cycle as performed in the paper mill, and (3) the great viscosity change which takes place within the starch while in contact with the liquefying enzyme.

Starches for Enzyme Conversion

The starch industry today is offering highly developed products for enzyme conversion. In many respects these are tailor made for particular conditions which may exist in a plant. In addition to unmodified pearl starches such as Globe 3271 and 3272, which differ only in pH, there are a number of starches specially developed for enzyme conversion. Corn products No. 3275 is an example. This starch is pretreated with calcium salts to stabilize, protect and control the amylase enzyme activity during the conversion cycle for optimum results.

The starch industry is also aware of the fact, which is too seldom recognized, that while buffering salts are desirable for peak enzyme activity, an

excessive amount of buffering in the system, apart from pH, may adversely affect the uniformity of the starch conversion.

During the conversion cycle, a certain percentage of reducing sugar is formed which may act as a plasticizer to impart flexibility to the starch film and to the dried coating slip. This may be the reason that starches for enzyme conversion are ideally suited for high solids coating binders and may explain why they may be converted as high as 35 per cent solids and still possess good flow along with high adhesive strength.

Problems in Enzyme Conversion

It is not intended to leave the impression that there are no problems in the conversion of this type starch. The two basic problems are constantly with us. They are: (1) Maintaining viscosity stability of the converted starch at 30-35 per cent solids and (2) retaining efficient adhesiveness of the starch binder at these solids, to give the best possible bond between the coating and the rawstock.

The starch and coating industries are both cognizant of the definite relationship which exists between viscosity stability of the adhesive and the adhesiveness of the converted starch. Anything which can be done to overcome or minimize the variation in viscosity of the starch will also increase the efficiency of the bonding characteristics of the binder. Any unusual properties of the starch brought out by viscosity variations during the conversion will be accentuated when the pigment and starch slips are mixed for machine coating at solids of 60-63 per cent.

Importance of Viscosity Stability

Generally speaking, all of the machine roll coaters depend heavily upon stable viscosity and uniform solids to give them a constant coat weight with the same surface characteristics in their day to day production of coated papers. On several of the machine coaters the slip, which is of the consistency of mayonnaise, is applied in the nip of the gate rolls and thence distributed by evener and applicator rolls to the surface of the sheet. While it is frequently possible to increase or decrease the amount of coat weight applied by opening or closing the gate rolls slightly, this must be considered as temporary relief and hardly represents the most efficient coating operation.

For permanent relief from variations in solids and viscosity, the entire coating slip formulation should be examined with extreme care to see that there are no varying procedures which could introduce a variable into the coating slip preparation.

In high solids coating work, the pigment slip is made up at a solids level of 70-75 per cent with the starch portion at 28-35 per cent solids. Variables in coating weight and machine performance may be traced back to either the adhesive or pigment slip, and it is possible that other factors within the mill may be contributing to this discrepancy in performance.

Compatibility with Mill Water

It is imperative, for example, that the starch used must be completely compatible with the mill water during the liquefying cycle. This is a basic requirement in all high solids starch enzyme conversion work, and deviation can be a contributing factor in viscosity variations that adversely affect adhesive stability and bonding strength.

Non-compatibility of mill water and the starch can be recognized immediately by fluctuation in viscosity tests of the converted starch. Viscosity testing from batch to batch of converted starch should be constant, provided that it is carried on automatically with a time-temperature-cam setup. It is difficult to determine, when fluctuation of viscosity is encountered, just which of the supplier's various starches for enzyme conversion should be substituted, without evaluating the mill water in the technical service laboratory.

The starch industry today is prepared, through its technical representatives, to offer assistance in evaluating mill water, not only as to pH, but for chemical components. Such an evaluation can often result in recommendation of a particular enzyme conversion starch with appropriate buffering action blended in during the starch manufacturing process.

Once the correct starch has been established, it will usually be desirable to (1) check the cooking equipment and (2) examine the conversion cycle.

Cooking equipment may be of stainless steel, wood or coated steel. Copper or copper-lined tanks should never be used, as they will inactivate the enzyme units. Agitation in the cooker should be ample but not turbulent, and should continue at a steady level through the gelation period.

Conversion Cycle

If at all possible, the conversion curve should be controlled automatically with a time-temperature recorder. The starch and water slurry should be brought to the gel point slowly, to allow maximum dispersion of the starch and gradual swelling of the starch particles. The conversion holding period, usually 15 to 30 minutes, should be watched very closely as it is the gauge for determining proper viscosity for the coating operation.

The overall stability of the adhesive will be much better if the holding period is used for determination of viscosity, rather than resorting to an overdose of the enzyme and a short conversion period. The best possible conversion is the lowest possible viscosity for the particular coating setup, with the lowest possible percentage of reducing sugars, since the presence of these is not desirable from an adhesive standpoint.

The action of the starch liquefying enzyme is not selective; that is, it will not reduce the starch viscosity to a certain point and then stop. Conversion must be cut off at the proper point; otherwise, the starch will be converted into extremely small particles which will not deliver maximum performance from the standpoint of either viscosity or adhesiveness.

The final step of the conversion cycle is to heat the starch water solution to 200°F. The reason for this is to inactivate the enzyme so it will not thin out the starch further, to a lower viscosity than desired. After bringing to the peak temperature of 200°F., the starch adhesive is cooled to desired temperature for mixing with the clay portion of the coating formulation.

Medium Solids Coating

Coating paper on either a brush or roll coater away from the paper machine has been an established industry for years. There are many variations in the type of conversion coating applications, including the brush coater; air brush (also referred to as air knife and air blade); trailing blade and modified roll type coating.

For many years casein was considered the standard adhesive for this work, but in the last few years starch has come into rather wide usage as a conversion coating binder. In this coating, starch is not equal to casein in adhesive strength, but it does have advantages in that it is free from odor and does not form foamy coating color. Where real water resistance is not necessary, starch pigmented coatings have printability and machine performance generally equal to the casein sized coatings.

As in machine coating, the coating color is metered, applied and smoothed out on the surface of the sheet. But there are marked differences in the two types of application. First, rawstock in machine coating is either zero sized or very slack sized; in conversion coating, the rawstock is invariably sized, so the coating color must strike in and penetrate the harder sized conversion sheet. Second, solids content of the slip for machine coating is in the range of 55-63

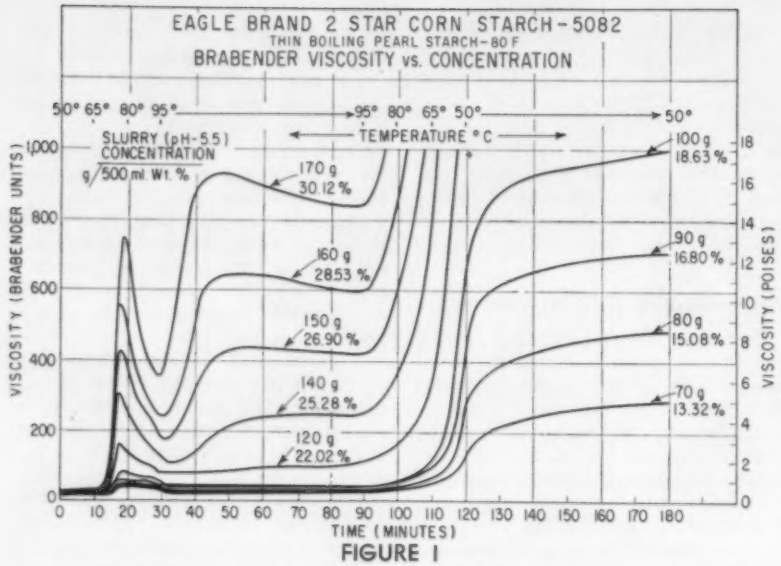


FIGURE 1

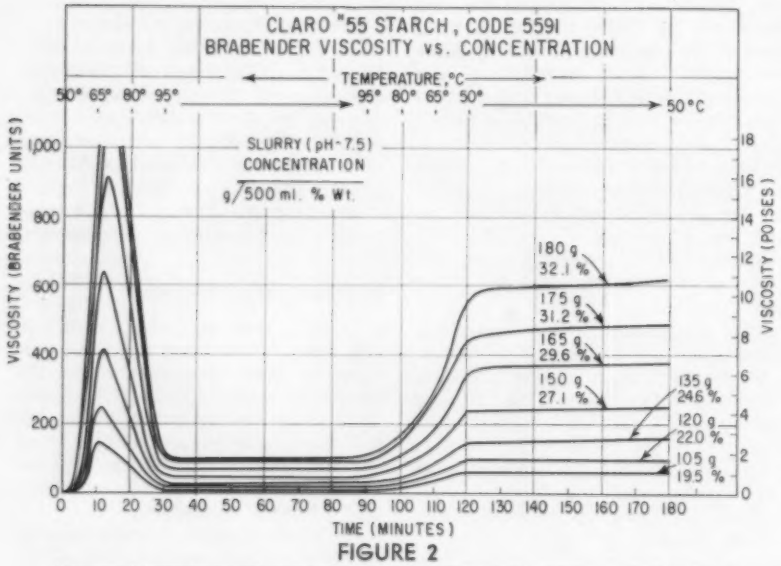


FIGURE 2

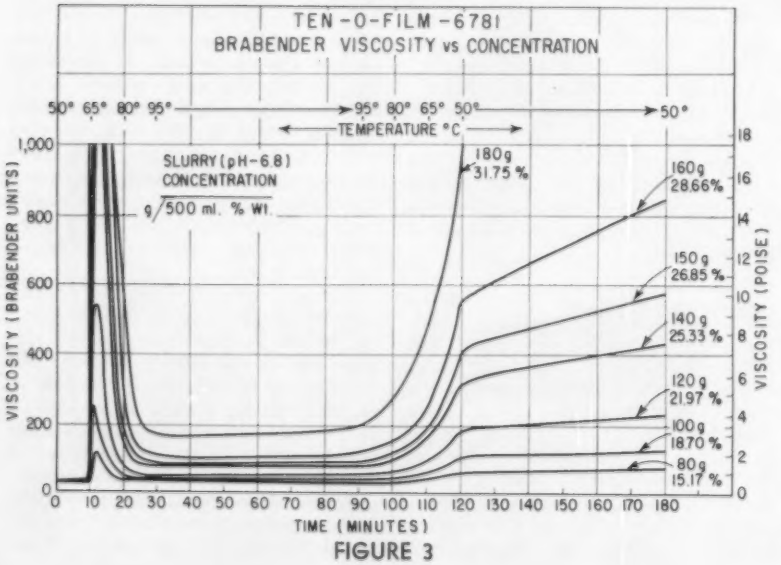


FIGURE 3

per cent while that of the conversion slip is from 35 to 50 per cent.

Because of the medium solids range of the coating, the starch adhesive does not have to be modified as thoroughly as in higher density work. For this medium solids application, it is generally felt that a different type starch is necessary—one in which the full adhesive strength is present at lower solids. The starch should retain good flow properties for mobility but at the same time possess sufficient body or water holding properties so that neither viscosity stability nor adhesiveness in the coating operation is sacrificed.

Oxidized Starches

The adhesive must impart sufficient fluidity to the coating so it can be smoothed out on the sheet by the coating applicator, but at the same time must not have so much fluidity that the rawstock is soaked or that drying operations are adversely affected.

Most of the starch adhesive used for conversion coating is a product especially modified in the starch plant to possess these characteristics—the oxidized starches. They are manufactured in a full viscosity range from the very heavy to the very fluid.

The oxidized products have proved very satisfactory in this type coating formulation because they mix readily with a pigmented slip and possess protective colloid qualities which hold the pigment in suspension. But their outstanding quality is their viscosity stability in the coating slip. This attribute can be traced back to the manufacturing process.

Oxidized starches are prepared by the addition of sodium hypochlorite to a starch-water slurry. The action of the hypochlorite, which is an oxidizing agent, introduces an irregular pattern into the linear structure of the starch particles, so they will no longer associate in micceller bundles. This modification strengthens the stability of the starch against thickening or gelation.

Stability of Viscosity

Viscosity stability is thus the factor which makes oxidized starches compatible in the coating color, and also is the reason that the acid modified starches have not been satisfactory for a coating binder.

The Brabender amylographs in Figures 1 and 2 indicate the different behavior of the regular thin boiling and oxidation modifications, with respect to viscosity and congealing tendencies. Of extreme importance to the coating industry is the lack of viscosity change

shown for the oxidized starch, after the adhesive has been cooked. Whereas the regular acid modified Grade No. 5082 (Figure 1) shows an enormous thickening after the cooked paste is cooled, the oxidized No. 5591 (Figure 2) shows very little change at this point in the adhesive preparation cycle. The viscosity stability of the oxidized starches is directly related to the stability of coatings prepared with these adhesives, and eliminates at least this one variable from the problems involved in production coating.

During acid modification, the molecules of the starch are not rearranged. After cooking and cooling to coating temperature they still retain the gelation characteristics of the pearl starch, which is a serious drawback to their use.

The oxidized starches are manufactured today under very exacting conditions in the starch plant. The modifying process is mechanically controlled to reduce variables to a minimum. It produces a starch with minimum variation in color-compatibility and performance in the coating mill. A typical starch of the oxidized group, modified with sodium hypochlorite and neutralized to a pH of 7.0 is Corn Products No. 5591.

Ethylene Oxide Starches

A newer starch derivative for medium solids coating is the ethylene oxide derivatized starch. This starch, like the oxidized product, is manufactured by the wet process. Lowering of the viscosity must be stopped at some point short of maximum reduction. Starches that have had their viscosity lowered tremendously contain the greatest amount of water soluble material. If reduction of viscosity, or the thinning process, is carried too far some water soluble material would be produced which would be lost in the washing operation, prior to drying.

Consequently, neither the oxidized nor the ethylene oxide starch is converted sufficiently for use in high solids coating where a minimum of water is used in preparing the adhesive. They have proved highly suited, however, to medium and low solids work, because of their excellent water holding properties and low fluidity.

An interesting characteristic observed in the use of ethylene oxide starch as a coating binder is improved ink receptivity. The coated sheet possesses better printability due to the fact that less ink can be used per impression.

As a class, the ethylene oxide starches are somewhat more expensive than the oxidized type. They are especially suitable as coating binders in the production of higher grades of coated paper, where their unusual stability of viscosity and freedom from setback help produce extremely uniform coatings. A typical example of the group is the new "Ten-O-Film" No. 6781, which is made from a milo base, is derivatized with ethylene oxide and neutralized as to pH.

The Brabender amylograph for Ten-O-Film Grade No. 6781 (Figure 3) shows that it is not as highly degraded as the oxidized starch Grade No. 5591, but that this type of product will have good viscosity stability. Unfortunately, Brabender curves tell us only of the viscosity characteristics of a particular starch, and offer no explanation in themselves for the excellent film forming ability and film strength of the particular starch in question.

Low Solids Coating

Besides the high and medium solids coatings, there is also a considerable tonnage of low solids coating which is applied at the machine size press. Size press application is the oldest and most commonly used method of application. Generally speaking, the solids in press coating run rather low—in the range from 20 to 30 per cent—although some mills raise the solids by blending with latex for higher density and coatable viscosity.

The original purpose of size press coating was to apply a low solids film of high brightness pigment blended with a starch adhesive to improve sheet brightness and also to increase the ash content of the paper. This "wash coat" could be applied to either the felt or wire side, or if necessary, to both sides.

The principle of applying the coating color at the press is the same as in high or medium solids coating. The coating slip is metered to the rolls of the press, applied to the sheet and smoothed out to avoid an uneven or wavy coating. Since the size press was not designed to be a coating applicator, the leveling out action is somewhat limited. Brushes and smoothing rolls, acting after the coating has been applied, have been tried out to assist in more even coat weight, with favorable results.

It has been proved in production that better results are obtained if the coating is applied by showers. These are used on the top of the sheet, and also on the bottom side to apply the coating against the face of the bottom roll. This aids in keeping the slip in suspension and allows for a little more pickup of coat weight on the wire side.

Because of the low solids of the coating color, the ratio of adhesive to pigment will be high. Usually the starch and pigment are on a one-to-one basis for ample adhesion to the sheet, and a high opacity pigment must be used to cover the rawstock. Also, because of the low solids of the slip, care should be taken in selecting a starch adhesive which has ample water retention. The water must not be released too quickly —before the coating is smoothed—nor held too long so that uneven coating and puddles result. For this work, both the ethylene oxide and the oxidized starches have performed with satisfaction. A higher viscosity starch is used in this low solids bracket than in the conversion coating application.

The size press is being used more and more as a coating applicator. The method has appealed to the conversion coater as it means a size press coated raw stock, and a double coating which enhances the printability. To the paper mill without coating applicators, it makes possible a new grade of coated paper with an improved surface.

Starches commonly used for size press application are oxidized and ethylene oxide starches similar to those used for medium solids coating, but of somewhat heavier viscosity.

REFERENCES

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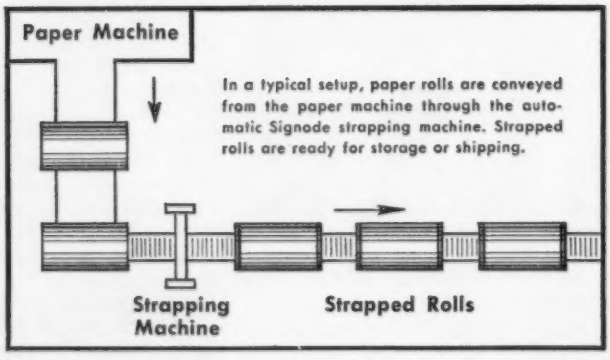
Machine applies strapping uniformly close to the edge of every roll.

Now! Automatic roll-end binding!

This new Signode roll-end binding machine is automatically controlled and operated. The strapping is straight, close to the edge, and uniformly tight and secure on every roll. The machine handles rolls from 32 inches to 60 inches in diameter and of any width —straps them more than fast enough for the largest of finishing room operations . . . automatically and dependably positions, tensions, seals, and cuts off the strap as the rolls are conveyed through it. There's nothing else like it!

These machines are now in operation in modern paper mills. For information on this important new development in the paper industry, call the Signode man near you, or write:


Paper Machine
In a typical setup, paper rolls are conveyed from the paper machine through the automatic Signode strapping machine. Strapped rolls are ready for storage or shipping.
Strapping Machine
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Authentic Civil War memenlos courtesy the Henry Ford Museum

No. 6 of a series.

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The pre-Civil War period was one of flamboyant and decorative elegance as is indicated by the illustration. Notice how the delicate tones and colors faithfully reproduce on coated paper using Dow Latex. In this instance, 80-lb. machine coated, gloss offset paper was used. A careful examination will show why only Dow Latex provides such an excellent printing surface.

For fine quality reproduction, specify latex coated papers

A coated paper using Dow Latex offers dramatic improvements to the printing surface of all grades of papers. It assures a clean, uniform sheet which is highly compatible to both offset and letterpress inks.

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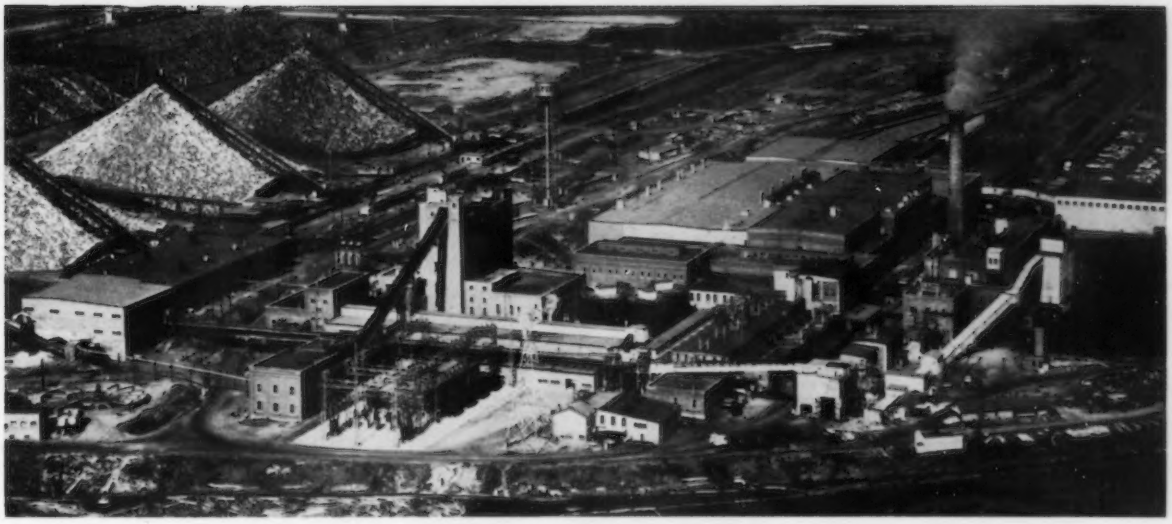
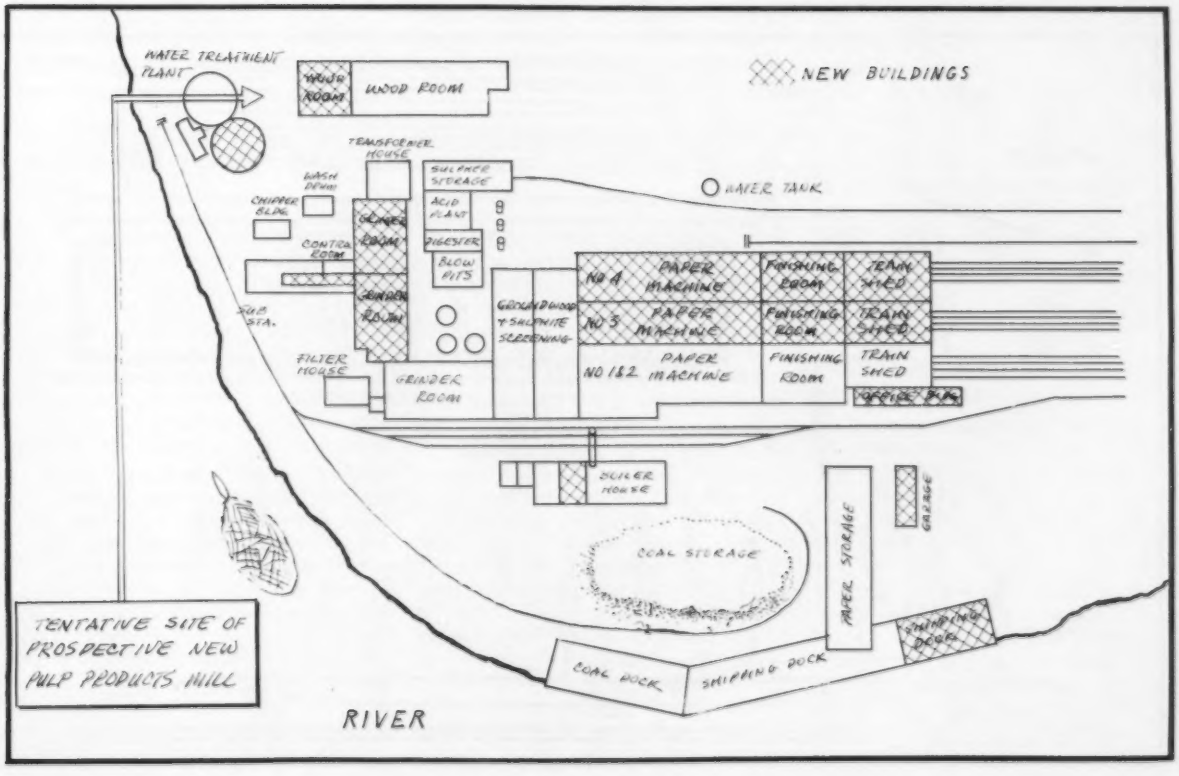


Major Expansion Completed at Great Lakes . . .

John C. W. Evans
Editor
Paper Trade Journal

. . . with world's widest machine producing a sheet 330 inches wide (342 inch wire). The company thus regains its former title for the biggest paper machine.



Last month the widest sheet of paper ever made came rolling off "Jupiter", the giant fourdrinier of the Great Lakes Paper Company, Limited at Fort William, Ont. The 342 inch wire giving 330 inch maximum trim makes it the widest newsprint machine in the world. Great Lakes has one newsprint mill with four machines and has no corporate connection with any other company, except its own subsidiaries. Fort William is the farthest west Canadian city to be served by the St. Lawrence Seaway.

For thirty years, Great Lakes had two paper machines, Judy and Jumbo. The latter had the widest trim, 296 inches, of any machine in North America during this time. Last year Jill joined the family with a trim of 254 inches. Now with the addition of Jupiter with 330 inch trim the mill has a capacity of over 1150 tons of newsprint per day, making it the third largest newsprint mill in the world, and the only one producing this quantity from four machines. All four machines were made at the Bagley and Sewall plant in Watertown, N. Y., the latter two since its acquisition by the Black-Clawson Co.

The first two machines, Judy and Jumbo had an original annual capacity of 100,000 tons a year; through improvements this has been increased to 156,000 tons. Jill increased capacity by 90,000 tons a year, and now Jupiter adds another 115,000 tons, making a total of about 360,000 tons annual capacity. In addition the mill will produce about 20,000 tons a year of market unbleached sulphite pulp. To produce this quantity of paper and pulp, 460,000 cords a year of pulpwood would be required. This is nearly four times the pre-war consumption.

Cost of Project

An expansion project of this size required extension to every part of the mill. This included, in addition to departments directly connected with pulp and paper production, expanded steam plant, fire protection, water treatment, and other facilities. Expenditures may be broken down as follows:

Two newsprint machines with auxiliary equipment and building	$18,000,000
Groundwood mill expansion including building	4,000,000
New electrical substation and distribution system	5,000,000
New woodyard, wood-handling system and woodroom expansion	2,800,000
Two new boilers and steam plant improvements	1,800,000
Other facilities	3,900,000
Total	35,000,000

New Buildings

The expansion program included seven new buildings, with a floor area of 6½ acres. They are indicated on the accompanying drawing, and are as follows:

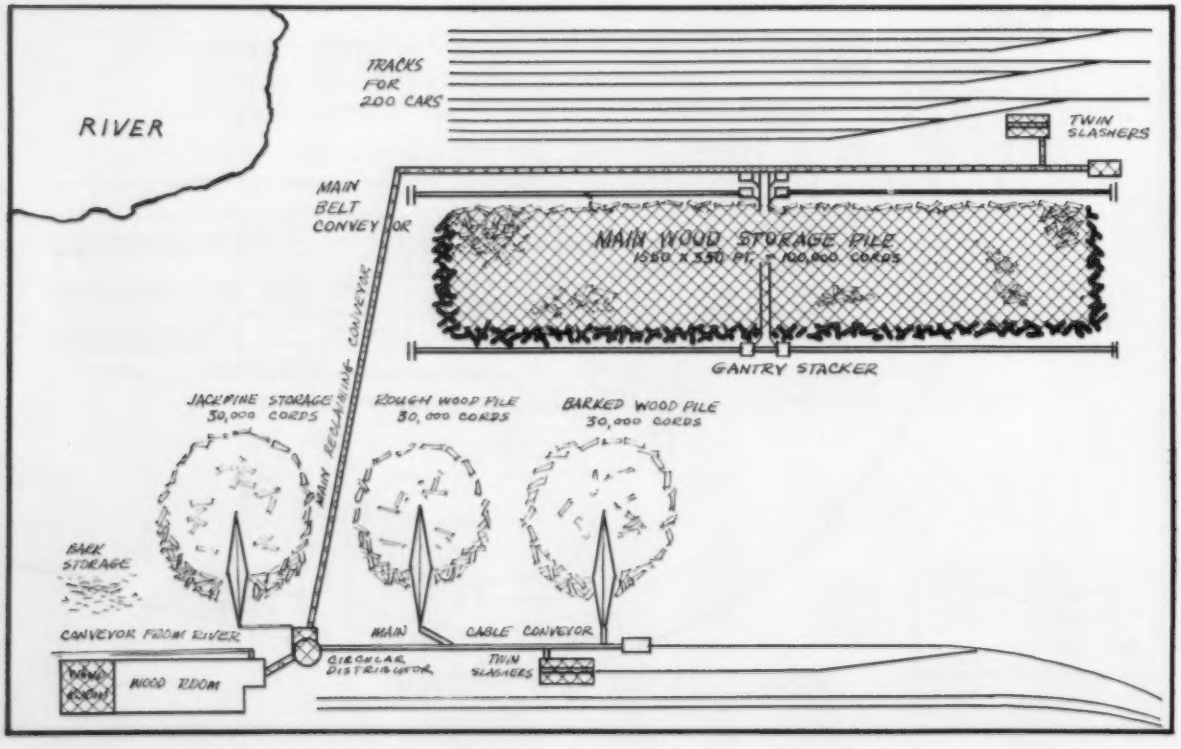
Machine Room, 162 by 440 feet, to house the two new paper machines. Each machine is 23 feet high. No. 3 is 350 feet long. No. 4 is 370 feet long.
Finishing Room, 162 by 115 feet, for wrapping and handling the newsprint rolls as they come from the new machines.

Train Shed, 162 by 175 feet, with tracks for 21 railway cars in which newsprint from the new machines will be loaded for shipment.

Grinder Room, 75 by 300 feet, to house 20 new magazine grinders with 10 new electric motors, each 5,000 h.p., for making groundwood pulp.

Wood Room, 90 by 112 feet, to house three new barking drums and new bark presses, handling the increased pulpwood supply.

Substation, 30 feet by 125 feet, to house the new electrical substation, connected



with new power lines brought across the Kaministikwia River.

Office Building, 50 feet by 200 feet, replacing temporary quarters, a mile from the mill.

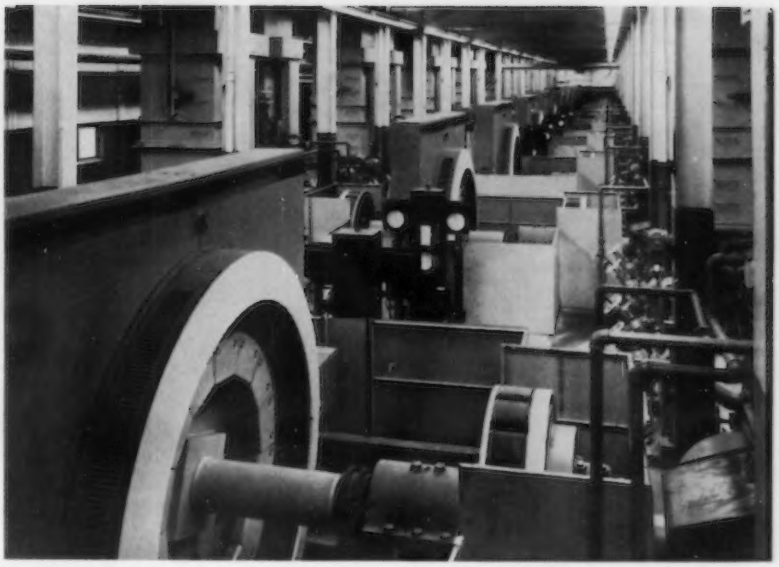
Woodhandling

Aside from the new paper machines the most notable feature of the project is the new woodyard. This area can store 100,000 cords in a rectangular shaped pile served by a gantry traveling stacker. This is in addition to the existing three circular piles with a capacity of 30,000 cords each, served by stationary inclined stackers. The new facilities permit the handling of a maximum of 4,000 cords per day.

Wood is received by rail, water and truck in decreasing order of importance. The new woodyard was designed primarily for rail wood handling. There is at the plant site over nine miles of trackage, and up to 475 cars per day may be handled. The main part of the new trackage is located north of the new storage pile as shown in the drawing. Here the rail wood in 100-inch lengths is removed from the cars by a crane with a wood grapple and dropped onto the deck of a twin slasher with a total capacity of 2,000 cords. Here the logs are cut to 50 inches and fall onto a short length of belt conveyor, which delivers it to the main belt conveyor running the full length of the new woodyard. The wood is diverted from this conveyor by "glance boards" to a rubber belt shuttle conveyor feeding an inclined chain conveyor which lifts the sticks to a gantry stacker where glances knock them off to the required place in the pile. The gantry stacker can build a pile 1550 feet long, 45 feet high and 350 feet wide, giving a capacity of 100,000 cords.

To the south, existing trackage serves the three old circular piles. Here there is also a twin slasher which delivers to a cable conveyor feeding the individual inclined stackers at each pile. Jack pine utilization is controlled by shipping it to the mill in separate cars, and by storing it separately in one of the circular piles. Only unbarked wood may be stored in the gantry pile, existing piles may receive barked or unbarked wood.

Wood is recovered from all the piles by traveling cranes equipped with orange peel grabs which drop the wood in portable chain conveyors feeding the main belt conveyor in the case of the gantry pile, or the cable conveyor in the case of the circular ones. Both of these deliver to the circular sorting table or distributor, which as can be seen from the drawing is the heart of the woodhandling system. This is a large flat circular steel conveyor which may receive wood from the new or old piling system of the woodyard and send it to the woodroom.



Looking down the line of ten 5,000 h.p. motors driving 20 grinders in the new groundwood mill.

River wood is delivered by an existing jack ladder to a cable conveyor feeding a slasher located inside the woodroom. Because it was decided to store unbarked wood in the new pile, it was not necessary to enlarge the woodroom in proportion to other facilities in order to handle peak wood receipts. Therefore only three new barkers were added to the existing ten in the woodroom. The new drums are Canadian Ingersoll Rand Weldrum type.

Groundwood Mill

A new groundwood mill was constructed adjoining and at right angles to the existing one. There are ten lines (two stones per line) of Koehring-Waterous magazine grinders with 5,000 h.p. motors on each line. The existing groundwood mill with a daily capacity of about 400 tons per day uses Great Northern grinders, which were chosen to replace the original pocket grinders immediately after the war in order to utilize existing building.

Pulp from the new grinders is screened on two inclined perforated plate type bull screens with traveling scrapers. The pulp is then screened in a line of 10 Cowan screens. Rejects are rescreened in another two Cowan screens with accepts to the inlet of the primaries. These rejects together with shredded bull screen rejects are refined in six new Sprout Waldron disk refiners. Refined rejects are sent to the bull screens. The new mill has capacity to produce 600-650 tons of groundwood per day. Entire output of both groundwood mills, up to 1050 tons per day, are passed through 28 Dirtec centrifugal cleaners for final cleaning and removal of grinder grit. This pulp is then thickened on 18 Cowan deckers and 10 Oliver deckers.

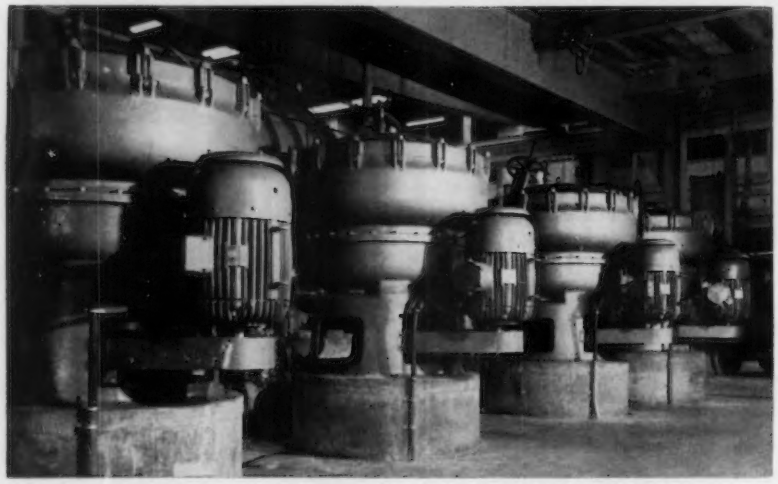
Sulphite Mill

Sulphite pulp mill capacity was more than adequate to take care of the new machines and still allow some for sale as market pulp. Nearly 65 tons a day of this latter will still be available. Recent improvements in the sulphite mill include: installation of four new Cowan deckers to replace existing equipment, Centri-cleaners for cleaning all sulphite pulp and a Bauer refiner to handle screen rejects. There are a total of 384 Centri-cleaners (366 Type 620, 6 Type 606 and 12 Type 623), all arranged in straight lines.

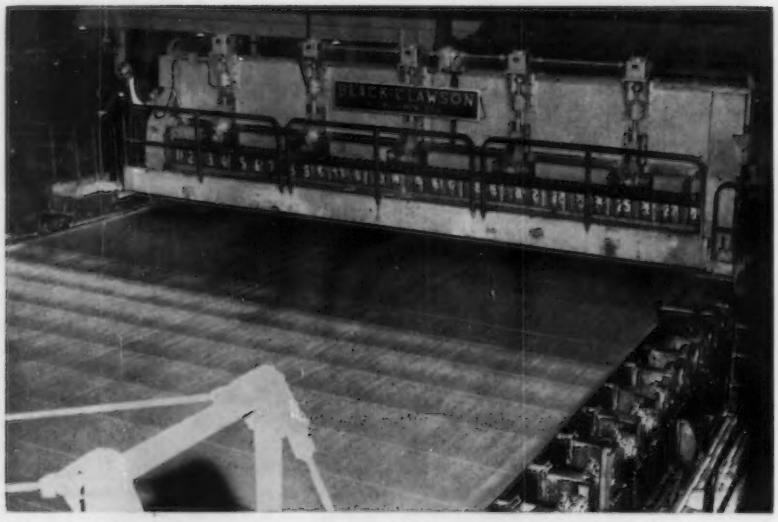
Stock Preparation for No. 4 Machine

The sulphite and groundwood are pumped through individual Trimbey consistency regulators to a Cowan proportioner which measures and proportions the two stocks together with the broke. The stock drops from the proportioner to a machine chest from which it is drawn off by the fan pump. The fan pump for Jupiter, believed to be the world's largest for newsprint, with a capacity of 22,000 U. S. g.p.m. was supplied by Allis Chalmers. It is driven by a 400 h.p. motor. The fan pump delivers the stock to four Bird Centri-screens which in turn deliver it

Jupiter (at left), the world's widest paper machine. The "small" machine (254 inch trim) in right foreground, named Judy, was started up last year.



Four Centri-screens provide final cleaning for all the stock to Jupiter.



Close-up view of pressure headbox and 342 inch wide wire on the mammoth machine.

to the headbox of the paper machine. Centri-screen rejects are sent to the groundwood screening system.

Number Four Wet End

The complete Number Four paper machine was supplied by Black-Clawson Co. and is designed to make 32-pound newsprint at a speed of 2250 f.p.m. At top speed it can produce up to 475 tons per day. The pressure headbox includes a manifold and series of feed pipes discharging into an explosion chamber, distributing rolls and an adjustable slice. The breast roll is 38 inches in diameter and 347½ inches long. There are one primary and two auxiliary forming boards, 16 rubber covered table rolls (18½ inches in diameter by 347 inches long) and 13 stainless steel deflectors. The six stainless steel suction boxes are maple covered. The suction couch roll (drilled face, 54 inches diameter by 355½ inches long) has a single cast iron suction box. The wire is driven by a drive roll (bronze covered steel) following the couch. This roll is 40 inches in diameter by 346 inches long. A rubber covered presser roll (top couch roll) rides on top of the couch and is 28 inches in diameter and 346 inches long. The presser roll is equipped with a hydraulic lowering and lifting mechanism with automatic lifting in the event of power failure. There are six wire return rolls, rubber covered and 20¾ inches in diameter by 347½ inches. The wire is 342 inches wide by 117 feet 2 inches long. There are stainless steel saveall pans under the entire length of the forming area from the breast roll to the last suction box. The fourdrinier frame of welded steel, stainless clad is Hydroflyte cantilevered quick wire change design. There are Emerson showers and Lodding doctors on the wire rolls. The shower pipes are of

stainless steel, six inches in diameter and 412 inches long.

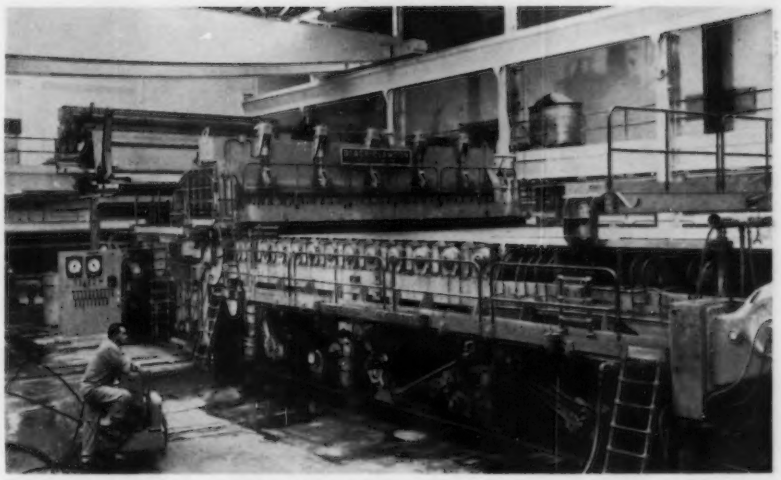
No. 4 Press Section

The press section's principal components are: the vacuum pick-up; a straight through suction transfer press in which the sheet is transferred from the pick-up felt to the first press felt; a suction first main press whose felt passes through this press and the transfer press; and a suction second main press with its own felt. The pick-up felt is equipped with a wringer press. Press section roll data is given in the table below:

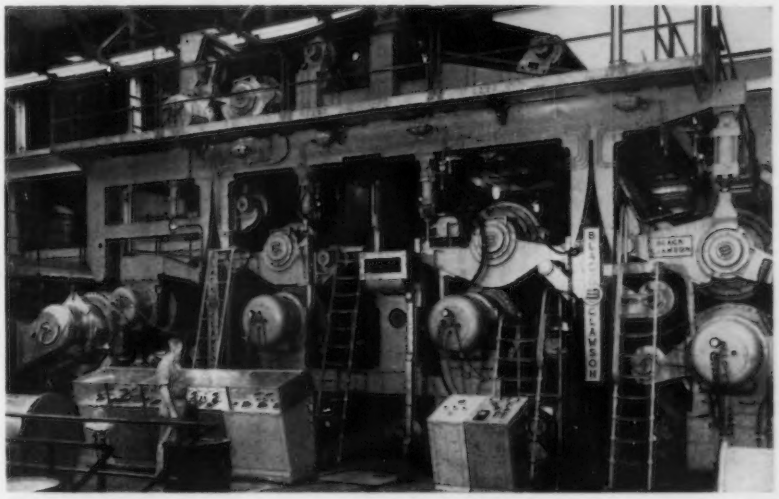
Load & Lift	—Hydraulic.
Suction Pick-up Roll	—40 in. diameter by 348 in. bronze shell double box—one 4 in. wide and one 12 in. wide.
Wringer Press	
Suction Roll	—40 in. diameter by 348 in. D.F. bronze shell, single box eight in. wide.
Squeeze Roll	—40 in. diameter by 350 in. face C.I. body rubber covered.
Transfer Press	
Bottom Suction Roll	—50 in. diameter by 348 in. D.F. bronze shell, rubber covered, single box six in. wide.
Top Roll	—40 in. diameter by 350 in. face C.I. body, rubber covered.
1st Press	—Suction.
Bottom Roll	—50 in. diameter by 348 in. D.F., stainless steel, rubber covered, 30-35 P & J. Single box six in. wide.
Top Roll	—48 in. diameter by 350 in. face granite.
2nd Press	—Suction.
Bottom Roll	—50 in. diameter by 348 in. D.F., stainless steel, rubber covered 30-35 P & J. Single box six in. wide.
Top Roll	—48 in. diameter by 350 in. face, granite.
Press Felt Rolls	—Eighteen 20¾ in. diameter by 354 in. face, rubber covered.
Paper Roll	—Two, 13½ in. diameter by 368½ in. face, rubber covered.
Guides	—Three, air operated.
Stretchers	—Three, air operated, one horizontal, two vertical.
Felt Conditioners	—Three, variable speed (one), constant speed (two). Six Jordan shoes each.
Felt Lengths	—Pick-up felt 83 ft. by 97 ft. First press 84 ft. by 97 ft. Second press 48 ft. by 61 ft.

No. 4 Dryer Section

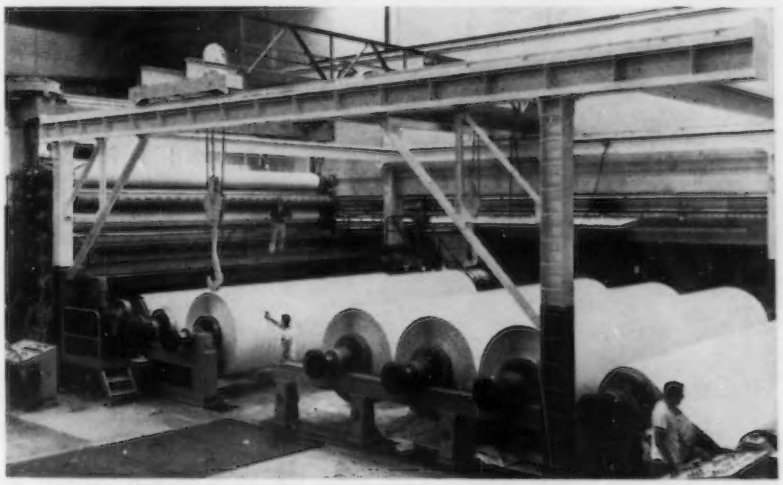
The dryer part of Jupiter has 55 paper dryers and 14 felt dryers and is di-



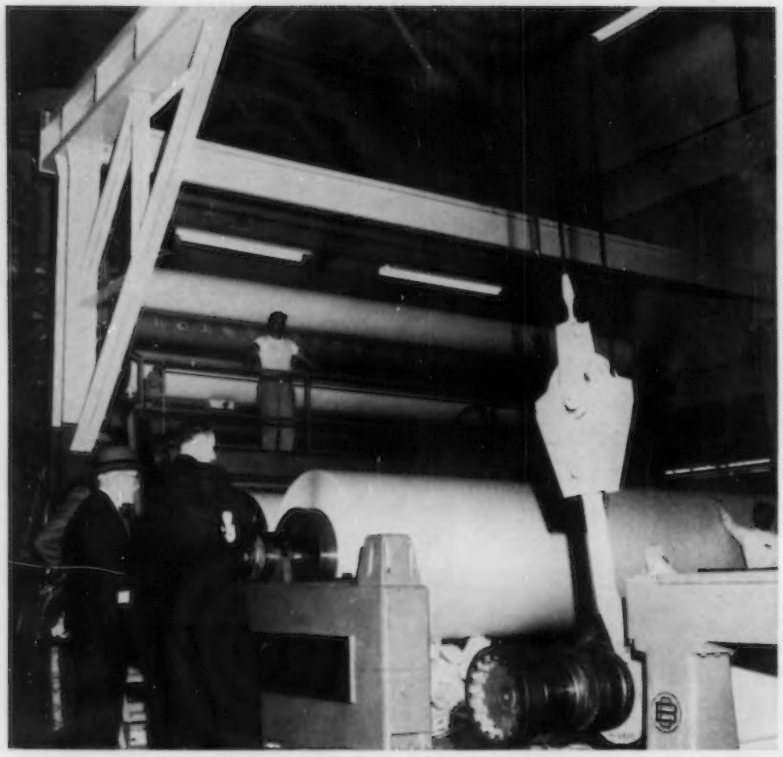
Fourdrinier view shows 350 inch wide headbox and the wire which is 117 feet 2 inches long.



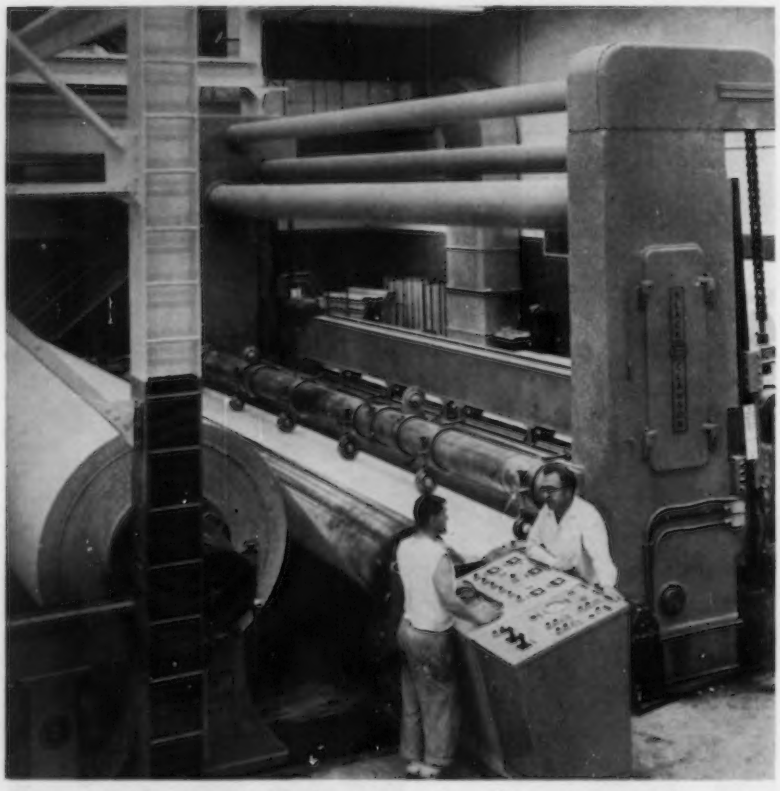
Massive press section includes vacuum pick-up, transfer press and suction first and second main presses.



Seven roll calender, Autoflyte reel and bridge to winder back stand.



Inspecting the calender and reel on Jumbo are Stuart Kay (International Paper) and R. O'Connor (A.P.P.A.).



Giant winder has two 30 inch drums and makes rolls up to 44 inch diameter at 6,000 f.p.m.

vided into four sections. The first three sections each consist of 14 paper dryers and four felt dryers, with the addition of a baby (lead) dryer on the first section. The last section consists of 13 paper dryers, two felt dryers and one cooling dryer. The paper, felt and cooling dryers are 5 feet in diameter by 340 inches long. The baby dryer is 48 inches in diameter. The dryers are cast semi-steel, tested for 150 pounds hydrostatic pressure which gives a working pressure of 75 p.s.i. Steam joints are Cowie type and drainage system is a Ross Midwest Fulton design. Six Lodding doctors are provided for the first dryers.

Dry End

Because of the weight of the individual rolls, the calender is restricted to seven rolls. Threading the stack is facilitated by a short lead or rider roll, running on the top roll at the front side. The stack is open side design with the open side toward the reel. The calender rolls are 338-inch face and diameters are as follows: bottom 44 inches, intermediate 24 inches, others 20 inches. Calender rolls are equipped with Lodding doctors. Three rolls are bored for steam. Reels are stored on transfer rails before the winder.

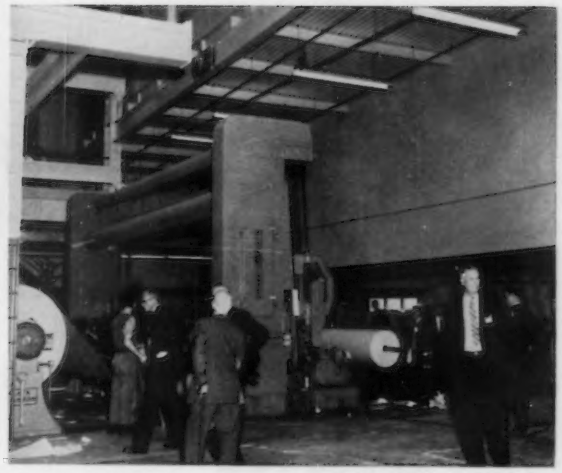
The Autoflyte design reel will handle 72-inch diameter rolls and is pneumatically operated. The reel drum is 48 inches in diameter and the reel spools are 30 inches. The winder is a Black-Clawson model 350, with two drums 30 inches in diameter and designed to produce up to 44-inch diameter rolls at speeds up to 6000 f.p.m.

The aluminum dryer hood is of Svenska Flaktfabriken design. The ceiling of the hood is made up of adjustable panels so that air may be pulled from any area desired across the dryer and up into a continuous plenum chamber running the whole length and width of the hood.

This ventilation system is identical in design with the one supplied for No. 3 machine. Jupiter is equipped with an open type aluminum hood, with a length of 187 feet, 41 feet wide, and an overall height of 20 feet measured from the floor. The exhaust from the hood plenum chamber is directly connected to a central plenum chamber of concrete, through which the moist air is exhausted and passed through six SF heat recovery units placed on the top of the plenum chamber. The heat exchangers are made of high purity aluminum, each unit built up of six exchangeable sections. All exhaust fans, and runners, as well as the housings, are made of welded aluminum plates.

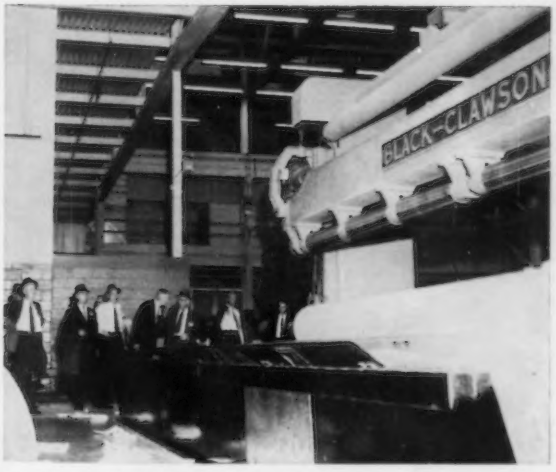
Three of the six heat exchangers supply air direct to the felts. Part of the dryer section located in the basement

Visitors inspecting the wet end. F. W. Bradshaw (Consolidated Paper Corp.) is on the walkway. J. J. Johnson (Watertown Daily Times) is checking couch vacuum.



Dry end of Jumbo gets a thorough looking over by most visitors but D. G. Driscoll (Sorg) has his eye on Judy.

Watching reel change: G. W. Pepper (Scott), K. F. Landegger (B-C), C. J. W. Fox (Great Lakes), W. Brown (Grace), A. T. Hurter (S-H) and A. Pupeeza (Great Lakes).



Looking at the rolls build up on the world's biggest winder: Ward Harrison (Riegel) at left and Bruce Otis (B-C), at right may be recognized.

is enclosed with aluminum panels to avoid any leakage of air to this area. By using a concrete channel in the basement floor for carrying the air to the felt, a minimum of space is used here for air ducts. The air supply to the felts is arranged with vertically mounted cross ducts, fed from the main concrete air channel in the center under the machine. Air flow to the felts can be adjusted crosswise; thus utilizing the air flow for maximum assistance in obtaining an even dryness across the sheet. The remaining three heat recovery units supply ventilation air to the machine room, basement, finishing room, and workshops. The moist air, as well as the fresh air, can by-pass the heat exchangers during warm weather, thus decreasing the wear on the heat exchangers to a minimum. There is also provision for recirculating the entire ventilation air during a shutdown, when low outdoor temperature exists.

There are high velocity air nozzles at the pocket between each dryer. The paper machine is driven by a Westinghouse 2500 h.p. Mag Amp sectional drive with 600 volt, 1150 r.p.m, d.c. motors.

To handle broke from the machine there are two Liebeck pulpers. One, a single shaft unit under the broke conveyor at the press section, and another, a four-shaft unit under the dryer end.

Auxiliaries

Two new 200,000 pound per hour tangential firing Combustion Engineering boilers have been installed to operate at 450 p.s.i. These two boilers have been designed so that they may use natural gas which is to be available shortly in the area.

A new electrical substation has been built with a new underground distribution system and new switch gear. The mill generates only about 12 per cent of its own electric power, the remainder is purchased from the Ontario Hydro-electric Commission.

Capacity of the water filtration plant has been doubled by the addition of a second settling basin.

The company holds 10,000 square miles of forest area north and west of the mill under license from Ontario provincial government. These areas assure adequate wood supply for capacity operation of the mill on a basis of sustained yield.

In order to effectively use all types of woods on its limits, including jack pine and the hardwoods, the company is investigating the possibility of building another pulp mill at Fort William.

St. Croix

gets off to another good start with

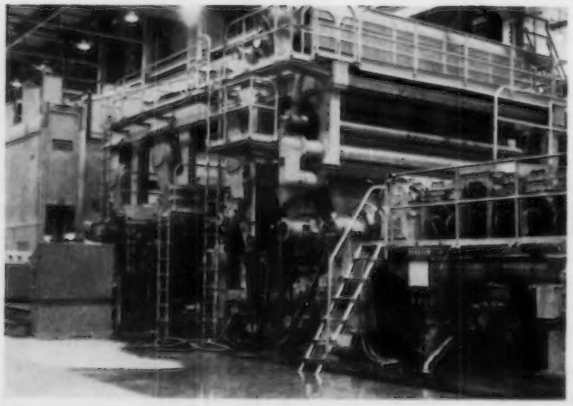
NEW

HUYCK FELTS

There are many new papermaking ideas highlighted by St. Croix Paper Company's recently completed $14,000,000 expansion. Especially newsworthy is the extensive use of automation in controlling stock preparation, machine operation, steam and electric generation — and the outstanding performance given by Huyck 4-D treated felts during the start-up of the new #4 Beloit newsprint machine.

These new machine advancements, coupled with those of Huyck felts, have enabled St. Croix's skilled papermakers to boost their daily production of highgrade newsprint from 325 to 430 tons, and ultimately 500 tons, to *serve more customers better*.

St. Croix, like other progressive-thinking companies, continues to buy Huyck felts to solve its felt application problems.



Huyck Suction Transfer Pick-up Felts in operation on Suction Transfer Press Section of St. Croix's new #4 Beloit 192-in. trim newsprint machine, designed to operate at 2,500 f.p.m.

St. Croix Paper Company's Woodland, Maine newsprint mill, recently expanded at a cost of $14,000,000. Compared with previous capacity, production has been increased from 325 to 430 tons daily.

Rolls of St. Croix Paper Company's newsprint ready for shipment.

HUYCK FELTS

Huyck Felt Co.,
Rensselaer, N. Y.;
Aliceville, Ala.:
Division of F. C. Huyck & Sons.
In Canada: Kenwood Mills Ltd.,
Arnprior, Ontario

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New Bleaching Method Revealed for Waste Paper Stock . . .

. . . at Third Annual Deinking Conference which was the largest and most successful yet. The excellent program included a number of interesting papers and a valuable panel discussion.

Ernest F. Barker

Special Correspondent,
Paper Trade Journal

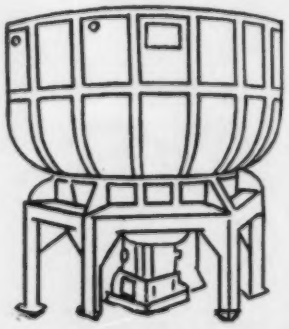
A new bleaching method and a new save-all were featured at the Third Annual TAPPI Deinking Conference held last week, on October 9 and 10 in the Dayton Biltmore Hotel, Dayton, Ohio. Registration was about one hundred forty, a large turn-out of "Deinkers." A. J. Felton, of Black-Clawson Company, Middletown, Ohio, was conference chairman. W. D. Rice, of P. H. Glatfelter Company, Spring Grove, Pa., was program chairman. G. J. Copp, of the Bauer Brothers Company, Springfield, Ohio, was treasurer and registration chairman. H. A. Taylor, Black-Clawson Company, was publicity chairman.

The Conference program consisted of two technical sessions on Thursday and Friday morning, each followed by plant visits. On Thursday afternoon the "Deinkers" toured the McFall Corp. and the Standard Register Co. plants, both in Dayton. On Friday afternoon the conferees toured two Black-Clawson plants, Shartle Division in Middletown and Pandia Division in Hamilton.

DEINKING COMMITTEE, left to right: A. J. Felton, Black-Clawson, conference chairman; W. D. Rice, P. H. Glatfelter, program chairman; J. J. Forsythe, International Paper, committee chairman; E. F. Andrews, International Paper, committee secretary, and W. D. Boggess, Beveridge Paper, committee vice chairman.

New Colored Ledger Bleaching Method

G. L. Kessler, of the P. H. Glatfelter Co. presented a paper on a new two-phase system for bleaching colored ledger, coauthored with R. F. Cashen, of the same company. Briefly, this paper described a recently developed modification of the well-known Hooker two-phase bleaching process. The new method, adopted for a deinking system, consists of a 15 minute chlorination period with about 100% excess chlorine, followed by the addition of sufficient caustic soda to neutralize the acids. The caustic addition raises the pH to about ten and forms sodium hypochlorite from the residual chlorine. The hypochlorite bleach is exhausted in about one hour and a half, according to the authors. This two-phase system was installed at Glatfelter in April of 1958 and it has met all expectations.



The development of this process was prompted by the increasing appearance of goldenrod colored papers in bales of colored ledger. Goldenrod colored papers have been notoriously difficult to bleach in deinking systems with single stage hypochlorite treatment. As little as five per cent goldenrod in bales of waste paper can produce a yellow residual color in the bleached stock.

The new system's chemical costs are comparable to single stage hypochlorite bleaching methods. The two-phase method is based on the original Hooker two-phase chlorination process patented in 1935. This process was designed for bleaching virgin unbleached pulp.

At Glatfelter the deinking stock is cooked in Dynopulpers with two per

cent sodium hydroxide at 180°F for one hour at six per cent consistency. The deinked pulp is then passed through a Jonsson screen, a 10 inch Vortrap, a series of 606 Bauer cleaners and a series of Bird screens. The pulp is then thickened in two Lancaster washers to 8 per cent consistency. The stock is then diluted to five per cent consistency and passed into a chest. From the stock chest the pulp is diluted to between 4 and 4.5 per cent consistency and the temperature is adjusted to 110°F.

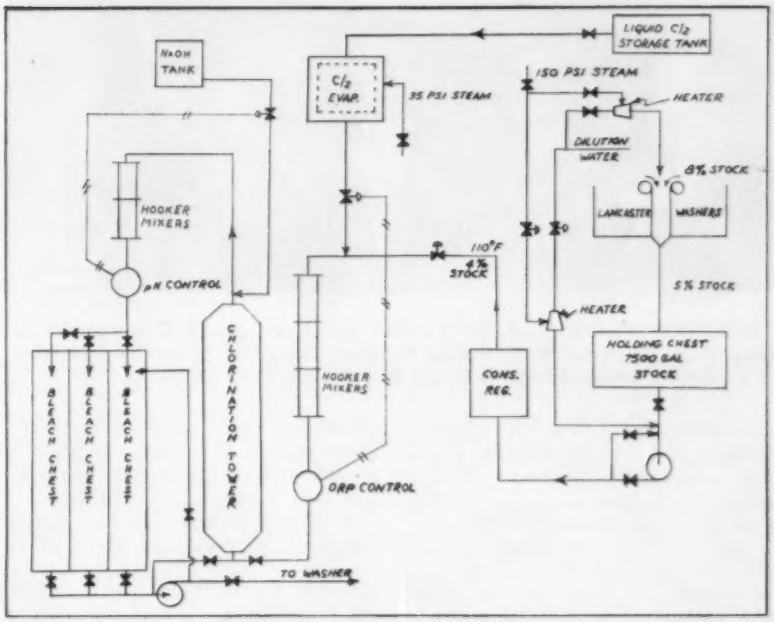
Now ready for bleaching with the two-phase bleaching system, chlorine gas is introduced into the deinked stock under pressure, with chlorine condition controlled automatically. The pulp is then passed through three Hooker mixers. After a 15 minute reaction period in a rubber lined chlorination tower, the stock is pumped into the bottom of a reaction chamber. The pulp flows upward and just as it leaves the tower, sodium hydroxide is added to neutralize acids formed, thus forming sodium hypochlorite. At this stage the pH is about nine. A pH meter here is part of the process instrumentation.

A reaction time of approximately 90 minutes usually exhausts the bleach. The bleached pulp is washed in a vacuum filter which is the final stage of this bleaching process. Glatfelter has found that less than 2.5 per cent of chlorine is required in daily operation because the difficult goldenrod-colored ledger is not always present in the deinking furnish.

Additional data, based on laboratory experiments, was revealed. It was found that the Hooker two-phase bleach produced a 77 per cent G.E. brightness compared with 63 per cent G.E. brightness for the hypochlorite bleach at same chemical cost. Bleaching time for the Hooker two-phase method was one hour less than the time required for normal hypochlorite bleaching. Other laboratory tests of the method revealed that brightness increases ranging from 2 to 15 points could be realized, depending on the type of deinked stock used. Mr. Kessler stated that less scaling is expected because of the replacement of a calcium hypochlorite with the sodium hypochlorite bleach. He also indicated that it is expected that the Hooker two-phase method should be able to handle deinked stock containing groundwood.

Further laboratory studies revealed that the process nets a gradual increase in final brightness with increasing chlorination time. Best results were obtained with a 60 minute chlorination cycle. Shorter periods of chlorination do however produce a pulp of considerably increased brightness than similar pulp, bleached with conventional hypochlorite. For this reason the mill decided on a 15 minute chlorination time.

Results have shown that the two-phase bleaching system produces a more uniform brightness because it is able to remove residual yellow color.



Modified two phase bleaching system for deinked stock at P. H. Glatfelter.

Utilization of Deinking Sludge

The possible utilization of the sludge which remains when the effluents of deinking mills are treated before passage to streams and rivers, is a recurring theme of Deinking Conferences. This year's deinking conference was no exception in the interest deinking mill personnel displayed in this subject. Russell D. Blosser, resident engineer of the National Council for Stream Improvement at Kalamazoo, Michigan, presented a paper on this subject.

Mr. Blosser presented a summary of the methods and processes which have been investigated for the reuse of deinking sludge. As an introduction, Mr. Blosser reviewed the present disposal method of deinking sludge. Current treatment of deinking wastes consists of sedimentation. The volume and the nature of the sludges produced vary, depending on the type of stock deinked and typical suspended solids losses range between 400 and 600 pounds per ton of deinking paper. Sedimentation removes from 40 to 85 per cent of the suspended solids. The ash content of such sludges varies from 55 to 65 per cent. Prime ash constituents are silica and aluminum.

Currently, deinking sludge is commonly disposed of as land fill material. Many mills, however, have lagoons in which no attempt is made to remove the sludge after solidification.

The possible reuse of sludge has been investigated and some mills are reported to have found a use of sludge as a filler for boxboard. This is however not a widespread practice because many deinking mills do not manufacture boxboard grades.

Experiments have been carried out with the use of sludge for the manufacture of molded products such as ash trays but such experiments never reached production stage.

As a land fill material, deinking sludge has not been proven an outstanding material. Deinking sludge does not withstand bearing pressure well and organic matter in the sludge causes shrinkage upon decomposition.

The effect of fly-ash mixed with deinking sludge was also investigated. (This idea was discussed two years ago by John L. Clouse, Sr., of Oxford Paper Company, West Carrollton, Ohio, in a report of studies on the subject at the first deinking conference in Kalamazoo.) Mr. Blosser reported that the plasticity of deinking sludge is reduced when mixed with fly-ash. This could enhance its value as fill material.

The use of deinking sludge as a soil conditioner has also been suggested. However, the main constituents of fertilizers are not common in the sludge produced by primary treatment. Secondary sludge (which results from the biological treatment of deinking waste) does however contain small amounts of the important fertilizing chemicals. Deinking sludge produced when deinking waste receives secondary treatment, may prove promising. Some

THURSDAY SPEAKERS—R. W. Pattison, Berkshire Color & Chemical; W. D. Rice, P. H. Glatfelter; R. D. Blosser, National Council for Stream Improvement; E. W. Petrich, Howard Paper Mills and G. L. Kessler, P. H. Glatfelter.

greenhouse studies have been made to compare this type of deinking sludge with commercial fertilizers. Further studies are, however, necessary for complete evaluation of this possibility.

The possibility of using deinked sludge as industrial filler has also been investigated. In these tests the sludge was incinerated at different temperatures. However, fusion of the ash produced a material too coarse for use in the paper industry as a coating or filling pigment. Another problem is that the calcined material is highly abrasive. Ball milling was attempted in order to reduce the coarseness of the material. However, the material remained coarser than the usual clays used in the paper industry.

The possible use of this calcined material in industries other than the paper industry has also been considered. Among industries which have been considered are the rubber industry and the building materials field. Laboratory samples of wall board, in which deinking sludge was covered with kraft paper, were made. The results showed that excessive shrinkage occurs when dry sludge is used in quantities greater than 25% with gypsum. A sludge-cement mixture has also been investigated.

Attempts have also been made to separate a light colored fraction of clay from deinking sludge. Electrophoresis proved too costly but flotation experiments showed that some separation is possible. Complete separation was however proved economically infeasible.

A general summary of this subject indicates that much work needs yet to be done before a practical and commercially feasible utilization of deinking sludge can be realized. Mr. Blosser suggested additional intensive laboratory work and also indicated during a subsequent question and answer period that centrifugal methods of sludge and effluent separation are being investigated.

Chemicals in Deinking

R. W. Pattison and S. Markowitz of the Berkshire Color and Chemical Corp., presented a paper, entitled: "Chemicals — Applications to Deinking." The paper was read by Mr. Pattison.

The deinking of most papers centers around the alkalis which serve to remove the many noncellulosic materials included in the stock being deinked. These many noncellulosic constituents include: alum, rosin, starches, gums, proteins, waxes, stearates, clays and other pigments.

Alkali chemicals used during the defibering (or cooking) process of deinking neutralize the alum and saponify resins and sizing materials in the papers being deinked. The following alkalis are commonly used: caustic soda, soda ash, sodium metasilicate, sodium silicate and numerous phosphates. Various wetting agents are added to assist in alkali penetration.

The wetting and penetrating chemicals added to deinking cook formulations, act as emulsifiers for non-saponifiable mineral oils, waxes and asphalt materials. Other chemicals used in deinking are dispersing agents which prevent the redisposition of loosened materials onto the fibers of the stock being deinked.

Mr. Pattison stated that "It is difficult to establish a universal deinking formula which will attack the various binders, oils, dryers and resins used in compounding inks." The paper subsequently reported on a number of ink formulations, including the use of the authors' product, including laboratory tests.

The paper concluded with the following statement: "With the use of Berkshire Color and Chemical Corp.'s synthetic liquid detergent, we feel it is now possible to deink with satisfactory results, without the need of washers, providing there is no sizing used on the machine and a pH of 7.5 to 8 is maintained.

Jones Vacuum Saveall

E. W. Petrich, of Howard Paper Mills, Inc., presented a report entitled: "A Progress Report on the New Jones Vacuum Saveall." (This new saveall has created considerable interest in the paper industry. It is likely that this Paper Trade JOURNAL report given below is the first detailed account of this equipment.)

This new vacuum saveall was designed by the E. D. Jones Co. and the first experimental unit was installed at Howard Paper Mills Inc. E. D. Jones engineers subsequently conducted extensive research at Howard, which resulted in some modifications and resulted in the equipment described here.

The Jones vacuum saveall consists of a traveling wire over a vacuum drum. The rich white water input point is located at the bottom of the vat and lean water output takes place through a header in the center of the cylinder. This is a sweetener-type saveall and sweetener stock addition rate is five pounds per minute. The unit is operated at approximately 400 gallons per minute. The vacuum drum is driven by a 7½ h.p. dual speed U.S. Motor varidrive. Liquid level in the vat is regulated by automatic liquid level controls and the speed of the unit is in turn controlled by the liquid level.

When the machine white water passes through the saveall wire, it

FRIDAY PANEL—E. J. Ferrell, Crocker-Burbank; H. E. Corwin, Diamond Gardner; J. W. Wenzell, Jr., moderator, Tileston & Hollingsworth; A. Brooks, Columbia-Southern Chemical and R. W. Pattison, Berkshire Color & Chemical.

reaches the saveall drum, equipped with a series of vacuum hoses which pass the water to the lean water discharge header in the drum center. The hoses turn with the unit while the header is stationary. Saveall speed and efficiency depend on the stock's drainage rate. Slow stock is thus transmitted through the sweetening mat at a slower rate.

The mill's white water system consists of the following: tray water, suction roll water and water from other machine white water sources collected in the couch pit. This white water is then passed directly to the Jones saveall. The saveall separates its effluent into two portions, "cloudy water" and "clear water." Howard uses the cloudy water in various mill showers and the clear water as beater make-up water. Excess clear water is sewered. (The reason for using the cloudy water in the showers is as follows: this water must be used quickly; it cannot be stored because the mill's frequent color changes would otherwise require dumping.)

Stock usually comes off the saveall at eight per cent consistency. This is then diluted to four per cent and returned directly to the machine chest.

Mr. Petrich reported that the installation has helped cut stock and white water losses substantially. Howard became interested in the unit because it had previously experienced high losses. The previous saveall system was inadequate and unable to economically handle the large number of color changes which are dictated by Howard's operations. On the paper machine now equipped with the new Jones vacuum saveall, losses previously ran as high as 5,000 pounds of suspended material per day to the sewer. These losses have now been reduced to less than 1,000 pounds per day. Water flow to the sewer has been cut approximately thirty per cent as a result of this new saveall installation.

The Jones Vacuum filter consists of an 8 foot diameter by 10 foot face drum. The unit requires 10 x 12 feet of floor space and it requires 16 feet of distance above seal box level in the basement to maintain adequate vacuum. For all practical purposes this means that this saveall must be installed on the first floor of the mill.

The reclaimed stock slides off at the rotation bend of the wire. An Emerson shower is used to assist this stock slide-off. The saveall wire is cleaned with a high pressure shower. 40-60 straight fourdrinier bronze wire is used. The wire requires souring, quite similar to wires on paper machines. Wire life is reported between 8 and 10 months. An automatic wire guide is part of the installation. Mr. Petrich estimated wire cost at approximately $500 per year.

A. J. Felton—Conference Chairman.

The sweetener stock used in this saveall consists of jordaned stock, taken directly from the machine chest furnish. In case of a break, the contents of the couch pit are also passed directly to the saveall. This of course produces an excess stock condition on the saveall and the mat may in such cases run three inches thick. Such a condition does not however produce overloading, according to the report.

Mr. Petrich indicated that Howard is currently installing four other Jones vacuum savealls on its other paper machines.

Deinking Chemicals Panel

The morning of the second day of the third TAPPI Deinking Conference was devoted to a panel discussion concerning "Chemicals for Deinking". J. W. Wendell, Jr. of Tilestone & Hollingsworth Company, was panel moderator. The panelists and their subjects were: A. Brooks, Columbia-Southern Chemical Co., "Caustic Soda and Soda Ash"; H. E. Corwin, Diamond Gardner Corp., Palmer, Mass., "Sodium Peroxide, Sodium Sulphite and Zinc Hydrosulphite"; R. W. Pattison, Berkshire Color and Chemical Co., "Detergents, Emulsifiers, Solvents and Flotation Agents"; E. J. Ferrell, Crocker, Burbank and Co., "Alum (In the deinking of wet strength papers), Sodium Silicate, Sodium Metasilicate and Mineral Fillers".

Mr. Corwin's discussion of sodium peroxide, sodium sulphite and zinc hydrosulphite, was one of the highlights of this panel session. He made the following comments about the use of peroxides in deinking mills: Peroxides are used to remove dyes which yield to oxidants. Peroxides are also used as bleaching agents (in combination with hydrosulphite). One of the advantages of peroxide lies in the fact that little color reversion is experienced with the use of these chemicals. For bleaching groundwood exclusively with peroxide, Mr. Corwin cited an approximate cost of $1.00 per G.E. brightness point per ton. However, there is a high initial cost of equipment capable of using peroxide. Recently, there has been considerable interest in using peroxides with a flotation process, capable of using high groundwood furnishes. In the tower system a typical peroxide bleaching use for high groundwood furnishes, consistencies run commonly between 12 and 14% at 140°F. It is possible that hypochlorite may be required for complete removal of some dyes before the peroxide addition point. Satisfactory results have been reported with peroxide and hydrosulphite formulation for high brightness bleaching of high groundwood content furnishes. It is said that brightness as high as 80 has been reached.

Zinc and sodium hydrosulphites have found application in deinking mills for removing dyes which yield to reducing agents. These chemicals have also been used for bleaching deinked stock. An approximate cost figure for the use of hydrosulphites for bleaching groundwood was given. This cost may be approximately $.60 per G.E. brightness point per ton of deinked stock. An advantage here is that the initial cost of using these materials is quite low.

Alum In Deinking Wet Strength Papers

E. J. Ferrell, made the following comments on the use of alum in deinking wet strength papers: Alum is not normally found in the long list of chemicals which are used in deinking. This is logical because the deinking process is essentially a detergency problem. However, in the case of wet strength paper, alum has a useful place in deinking. The conventional method of destroying wet strength is by the hydrolysis of the wet strength resins. This is accomplished by subjecting the wet strength stock to the action of an acid at elevated temperatures and with agitation in a beater or a pulper. Here is where alum is used but the amount required varies considerably depending on degree of wet strength treatment, time, temperature and pulper efficiency. Common temperatures range from 140 to 200°F. After the wet strength resins have been destroyed the stock can be defibered in conventional deinking processes. Required neutralization of the acid can be handled either by washing before the actual deinking cook or by addition of extra alkali during the cooking process.

Sodium Silicate in Deinking

A number of patents concerning the use of sodium silicate in deinking date back as much as 25 years. Although caustic and soda ash are the most commonly used alkalis, the milder action of the silicates makes them of special interest. Other advantages of the sili-

(Continued on page 54)

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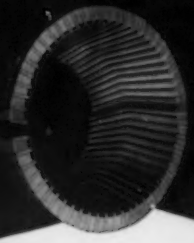

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D. W. Curtis—Banquet Speaker.

cates include good wetting action and the ability to disperse the particles of ink and other pigments loosened during the cook. Of particular importance in deinking furnishes which contain high percentages of groundwood, is the fact that sodium silicate tends to yellow groundwood less than caustic.

One part of sodium oxide to 1.6 silica, a very highly akaline silicate, has been used as sole deinking agent. In some cases it is fortified with a small amount of caustic. Another cooking formulation is a combination of silicate, caustic and sodium or hydrogen peroxide. A number of claims hold that combinations of three to six per cent silicate, 0.5 to two per cent caustic and one to three per cent peroxide, based on the weight of the stock, gives best results in cleanliness of pulp and increased brightness. It is, however, obvious that many claims have been made and that deinking chemical formulations vary greatly in deinking plants, with specific formulations dictated by conditions and laboratory and practical experience.

Detergents in Deinking

R. W. Pattison, Berkshire Color and Chemical Co., discussed detergents, emulsifiers, solvents and flotation agents in deinking. He outlined the highlights of these various chemicals used in deinking. Detergents are grouped into three general classes: anionic, cationic and nonionic. Detergents possess the property of lowering the surface tension between liquids and solids, two liquids or liquids and gases. They thus permit contact and wetting between two ordinarily incompatible materials. Anionic and nonionic types of detergents are presently used in deinking mills. They assist in wetting the old paper stock and thus permit penetration of the alkalis used in the cooks. The detergents also aid in dispersing and suspending color pigments and inks and they emulsify oils and nonsaponifiable materials.

Emulsifiers also find good use in deinking. Emulsifiers keep insolubles such as grease, oil, wax and asphalt, dispersed in water. Among other chemicals used in deinking, solvents are also used. Solvents are used to soften and dissolve certain ink, resin, asphalt and similar water insoluble materials.

Banquet Address

The Deinking Conference banquet, held on Thursday evening, was a dinner meeting sponsored jointly with the Ohio section of TAPPI. D. W. Curtis, of Beloit Iron Works, was banquet speaker; his subject: "Education for Pulp and Paper Careers." Following are highlights of Mr. Curtis' address.

Education for the pulp and paper industry is one of the major problems confronting the industry from the standpoint of manpower shortage. We have come to realize that our system for education in industry is woefully lacking. We must join other industries to encourage talented young people to get technical educations. Our second problem is to interest young people in the paper industry. Most young people are woefully ignorant about the paper industry and how paper is made, as compared with such a "glamor industry" as the aircraft industry, for example. Most young people know something about the "glamor industries" but they know practically nothing about the paper industry.

Mr. Curtis then reviewed some of the things that have been accomplished in the paper industry toward recruiting talented young people to get an education in pulp and paper making. Among these accomplishments, the speaker listed various motion pictures and an Institute of Paper Chemistry booklet entitled "Careers in the Pulp and Paper Industry."

The speaker made the following five concrete suggestions for what the industry could do to further pulp and paper education in the future:

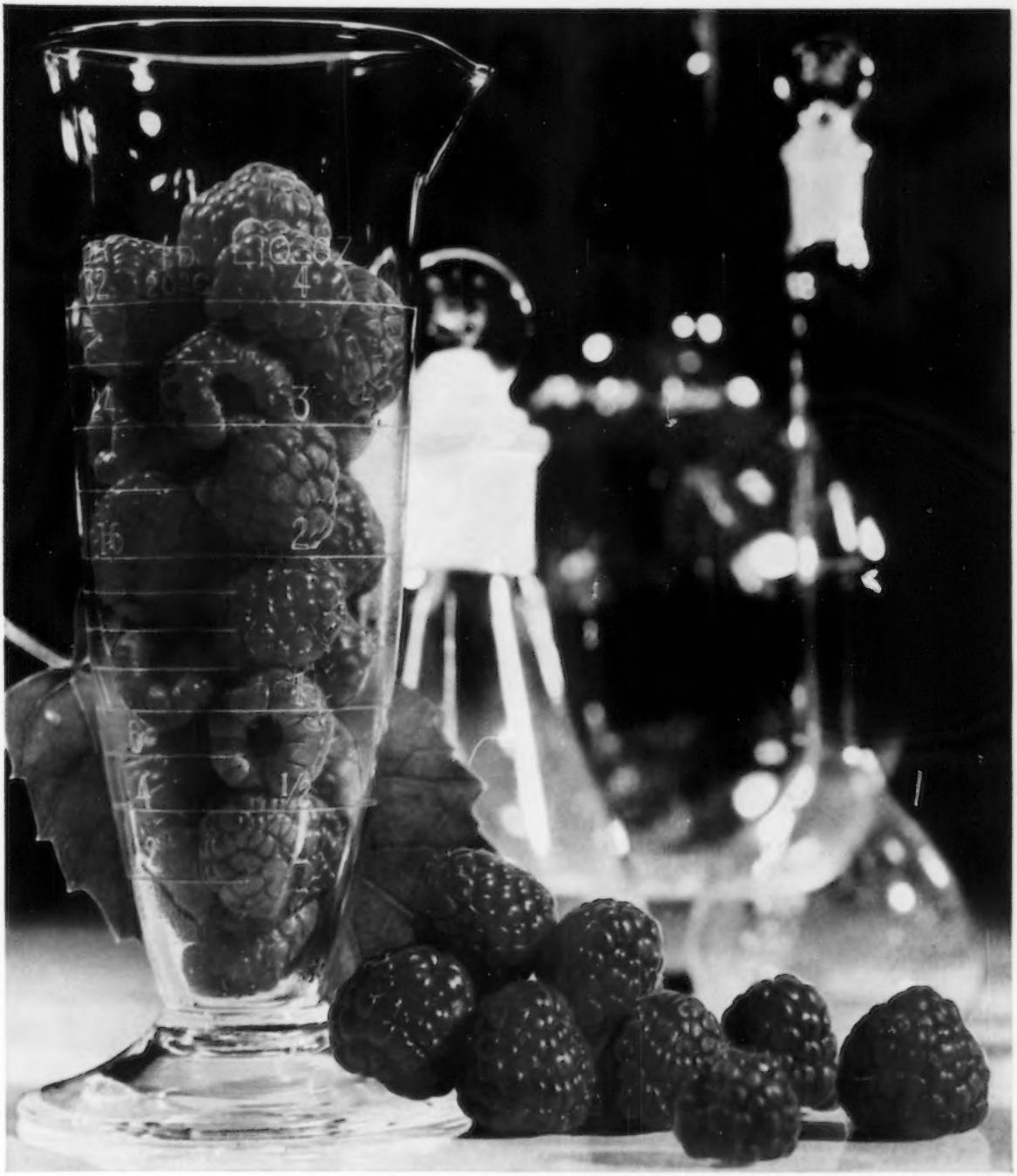
1 Continue to improve the career projects, which includes the booklet and a motion picture.

2 Produce new films covering the manufacture of pulp and paper for distribution to high schools. Much footage is already available from films produced independently by paper mills. Some of this available footage could be used. Mr. Curtis suggested a TAPPI sponsored film project.

3 Close liason between the paper industry and educational TV media, again to present the pulp and paper story to young people.

4 Close cooperation between TAPPI and the nation's universities.

5 An active campaign in which APPA and TAPPI would present the pulp and paper story to the general public. Mr. Curtis suggested that this could be furthered considerably if a central industry news bureau were established and if exhibits could be prepared for all types of public exhibitions.



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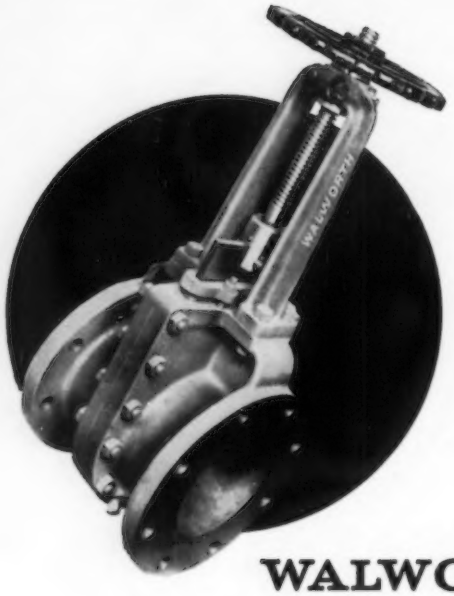

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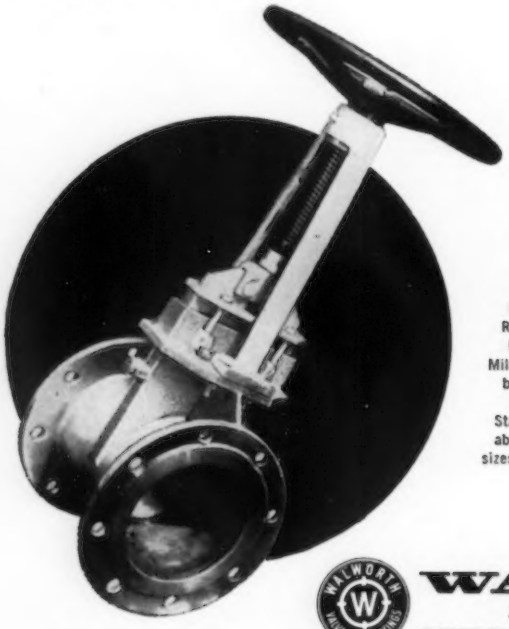

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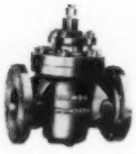
WALWORTH No. 725FS, OS&Y, FLANGED, SPECIAL ALLOY WEDGE GATE VALVES. Designed especially to retard caustic corrosion in the pulp and paper industry.

WALWORTH 928FS SPECIAL ALLOY SWING CHECK VALVES. Designed for the severe corrosive services encountered in the pulp and paper industry.



WALWORTH LUBRICATED PLUG VALVES. Easy turning—quick operating. Lubricant can be renewed while the valve is in service. Lubricant completely surrounds the plug ports assuring a tight seal against leaks.

WALWORTH also offers Plastic Valves and Fittings, and Walseal® Valves and Fittings. Walseal products have factory-inserted rings of silver-brazing alloy in threadless ports.

WALWORTH
750 THIRD AVENUE, NEW YORK 17, N. Y.
DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

WALWORTH SUBSIDIARIES: ALLOY STEEL PRODUCTS CO. • CONOFLOW CORPORATION • GROVE VALVE AND REGULATOR CO. M&H VALVE & FITTINGS CO. • SOUTHWEST FABRICATING & WELDING CO., INC. • WALWORTH COMPANY OF CANADA, LTD.

The Turn in the Economy — What It Means to Marketers

A. B. Layton, president of Crown-Zellerbach Corp., answered the following questions on the paper industry in response to a coast to coast economic survey, by telephone, conducted at the American Management Assn., Special Marketing Conference on Beating the Trend, held in New York recently:

Q. In view of present operating rates, would you say that the paper industry suffers from an excess capacity condition?

A. Yes. The paper industry is operating around 85 per cent of capacity, compared with a high of 98 per cent in 1956. But total production has dropped only about 3 per cent below the 1956 high. The excess capacity comes from substantial new facilities started several years ago in expectation of increasing growth, but completed amid a recession. So we are concentrating on more imaginative marketing to help catch up with our productive abilities.

Q. To what degree will additional expenditures for plant and equipment planned for 1958 and 1959, be postponed, stretched out, or even cancelled?

A. There has been a considerable cutback in the paper industry's capital expenditures for 1958 and 1959. Most of these expenditures are being deferred until paper consumption begins to catch up with the industry's productive capacity. This gap should virtually be closed over the next several years, depending on the rapidity of recovery from the recession. Economic recovery will unleash the dynamic growth of the paper industry, which has one of the highest sustained growth rates of any industry in the economy—averaging about a 4 per cent annual increase in production and demand for the past 35 years or more. Consequently, we should be able to progressively take up the slack in our increased capacity, beginning in 1959, if the industry continues to gear future plant expansion to the developing market situation.

Q. To what extent have the inventories of dealers and users been drawn down? Has any rebuilding of stocks begun?

A. Crown Zellerbach's experience, which seems similar to many other paper companies, is that dealers and users have reduced their inventories pretty much to a "hand-to-mouth" kind of level. We've had a tremendous increase in orders for immediate delivery and consumption. We've seen no evidence of substantial rebuilding of customers' inventories, and we don't expect any significant change in this situation in the near future—at least until such time as the supply-demand ratio comes into closer balance.

Q. How has the stability of prices figured in this inventory situation? Did the price factor serve to cushion the downswing?

A. Prices in the paper industry have been generally stable, with the exception of some minor adjustments. This general price stability seems to be a neutral factor in terms of inventory levels, since customers have had little reason to reduce or increase their inventories because of anticipated price decreases or increases. By the same token, this price stability has had a cushioning effect on the downswing.

Q. What is the outlook for prices in the next twelve months?

A. I think prices will remain reasonably stable over the next year. Of course,

(Continued on page 62)

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Sept. 6	Sept. 13	Sept. 20	Sept. 27	Oct. 4
1958	70.1	91.5	91.9	92.8r	89.9
	Sept. 7	Sept. 14	Sept. 21	Sept. 28	Oct. 5
1957	71.3	91.5	89.9	91.3	92.7

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	86.9	89.5	89.5	88.1	86.4‡	86.2‡	76.0‡	89.8‡	86.7‡	—	—	—	—
1957	94.2	97.0	97.1	94.0	94.6	93.3	75.6	90.7	86.0	93.0	90.7	81.5	90.9

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1951	1952	1953	1954	1955	1956	1957	1958
Year to Date	99.7	90.4	93.1	91.4	94.8	98.3	91.1	86.0
Year Average	98.0	88.6	92.3	91.6	94.0	97.9	90.9	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	Sept. 6	Sept. 13	Sept. 20	Sept. 27	Oct. 4
1958	73	97	95	94	95
	Sept. 7	Sept. 14	Sept. 21	Sept. 28	Oct. 5
1957	72	98	96	99	97

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	80	86	88	84	84	86	76	93	90	—	—	—	—
1957	91	94	94	92	93	91	72	94	91	97	92	79	90

† *Percents of operation based on "Inch-Hours" reported on a 6-day basis.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING Oct. 4, 1958	LAST WEEK ENDING Sept. 27, 1958	CUMULATIVE TO DATE Jan. 1 to Oct. 4, 1958
% Activity	95%	94%	86%
TOTAL	308,845	308,455	10,508,188
Liner	108,649	105,090	3,485,187
Corrugating Material	47,954	48,299	1,583,776
Chip & Filler Board	4,459	5,576	190,316
Total Containerboard	161,062	158,965	5,259,279
Folding	54,837	58,749	2,028,753
Set-Up	13,855	11,853	421,697
Special Food Board	28,528	28,113	989,226
Other	50,563	50,775	1,809,233
Total Boxboard	147,783	149,490	5,248,909
TOTAL ORDERS			
Received	373,237	288,837	
Unfilled End of Week	482,780	423,901	

NEW! America's first

TOE pressure for **FORWARD**
HEEL pressure for **REVERSE**
...smooth, accurate **"INCHING"**
...response is **INSTANTANEOUS!**

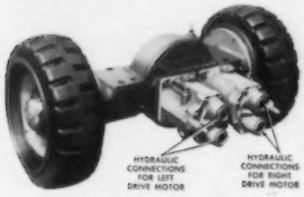
foot-controlled power transmission!

Unique method of instant power application introduced in Towmotor Fork Lift Trucks

TOWMOTOR *TOWMOSTATIC* DRIVE

It's really history-making!

NO clutch assembly
transmission
drive line
differential
gearshift lever



Twin Motors Power Drive Wheels!
Two positive-action piston-type motors transmit full power to drive wheels. Due to variable displacement characteristics of the motors they automatically adjust to torque and speed requirements demanded by driving conditions.

Towmostatic Drive is a Towmotor engineering achievement based on the principle of Hydrostatics . . . an entirely new method of pedal-controlled power transmission that simplifies lift truck operation, reduces hand movements to minimum, cuts maintenance costs and downtime sharply.

With this new drive Towmotor lift truck operators control *all forward and reverse travel* with their left foot on a treadle-type pedal—a natural heel-and-toe action. To go forward, simply press down with toe. To reverse, press down with heel. Response is instantaneous and glider-smooth operation is easily mastered with a few minutes' practice!

Conventional mechanisms eliminated

Towmotor Towmostatic Drive is the first method of power transmission to eliminate clutch assembly, transmission, drive line, differential, plus entire shifting mechanism. Many of the major causes of costly maintenance and downtime are thus eliminated.

Operating benefits are many

Smooth, accurate "inching" that simplifies stacking of goods is also obtained through Towmotor Towmostatic Drive. Maneuverability is unsurpassed—acceleration fast—gradeability greatly improved—lifting speed is integrated with drive control for maximum mass-handling.

Ask for Towmostatic Drive Booklet

Complete information on this revolutionary Towmotor power transmission is detailed in new illustrated booklet. Write to Towmotor Corporation, Cleveland 10, Ohio.

Leaders for 39 years in building Fork Lift Trucks, Tractors and Carriers

TOWMOTOR -GERLINGER
THE ONE-MAN-GANG

Gerlinger Carrier Company is a subsidiary of Towmotor Corporation, Cleveland 10, Ohio

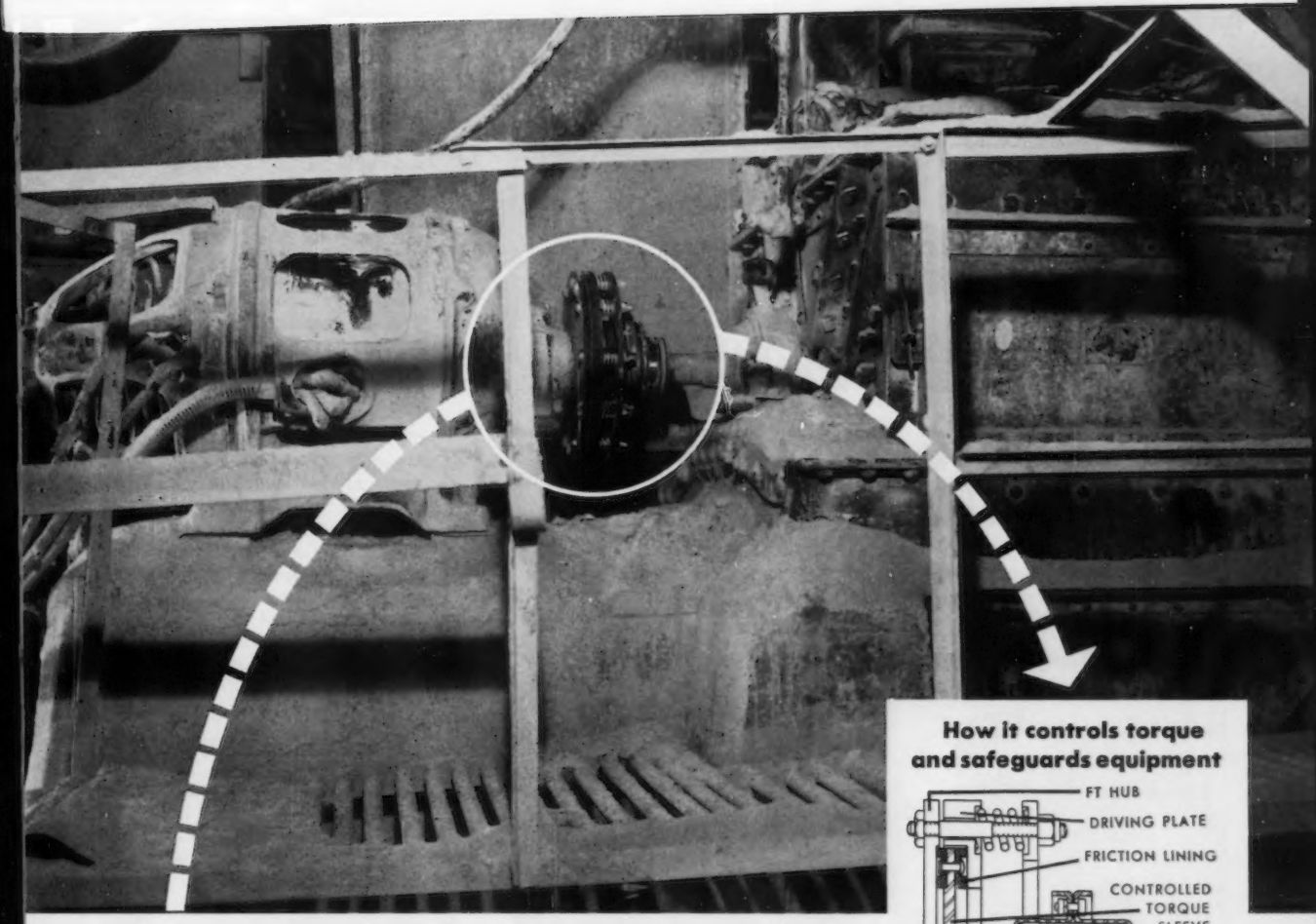
Here's why WEST END can answer your inquiry on product availability immediately!

When you phone an order or request information on current availability or long term supply of a product, the Sales Office Manager in Oakland with whom you speak can contact the plant at WEST END immediately. He talks by private wire teletype with the Production Manager. An answer or firm commitment is given immediately. It is relayed to you often while you are still on the phone.

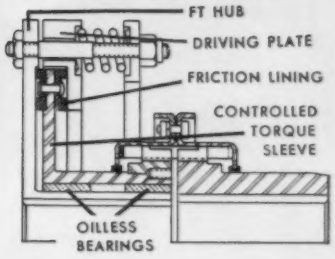
WEST END 's Sales Office Manager sales representatives and plant executives work together as a team manning a system that is, in our opinion, uniquely outstanding in the chemical industry. Their confidence in the efficiency of this system is reflected in the enthusiastic, helpful and friendly manner in which they promptly serve you . . . our customers.

WEST END CHEMICAL COMPANY
DIVISION OF STAUFFER CHEMICAL COMPANY
1956 WEBSTER, OAKLAND 12, CALIF. • PLANT, WESTEND, CALIF.

SODA ASH
SALT CAKE
BORAX • HYDRATED LIME



How it controls torque and safeguards equipment



Protect machines from overload damage with FALK Controlled Torque Couplings

The above picture shows a Falk Controlled Torque Coupling connecting a 150 hp motor to a hammermill. Formerly, when tramp iron got into the mill, it was necessary to rewind the motor at least twice a year. But, in the 2½ years after installing a Falk Controlled Torque Coupling, no motor repairs were required. *That is real saving!*

Wherever overload danger exists, a Falk Controlled Torque Coupling gives positive protection against machinery damage from excessive torque or jams. This unique coupling has an adjustable friction slip clutch which can be set at *any* predetermined torque limit. Thus, transmission of dangerous shocks is prevented...overloads are limited...shaft breakage is eliminated.

Another big advantage is that, when the cause of the overload is removed, the entire coupling will rotate and transmit power without resetting, and *without replacing parts or repairing the coupling.*...And, the Controlled Torque Coupling incorporates the famous Falk Steelflex torsional resilience to smother ordinary shock and vibration, plus the ability to accommodate shaft misalignment....Consult your Falk Representative or Authorized Falk Distributor. **Ask for Bulletin 4100.**

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN

MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS

Representatives and Distributors in many principal cities.

Here (as in photo), the torque-control hub is shown mounted on driving shaft. From this hub, power is transmitted through friction lining to controlled torque sleeve. Load to be transmitted is determined by the (pre-set) pressure on friction lining. In case of overload, this hub still rotates until power is shut off—but the rest of the coupling and the driven machine will slow down or stop.

Motor Shut-off Control

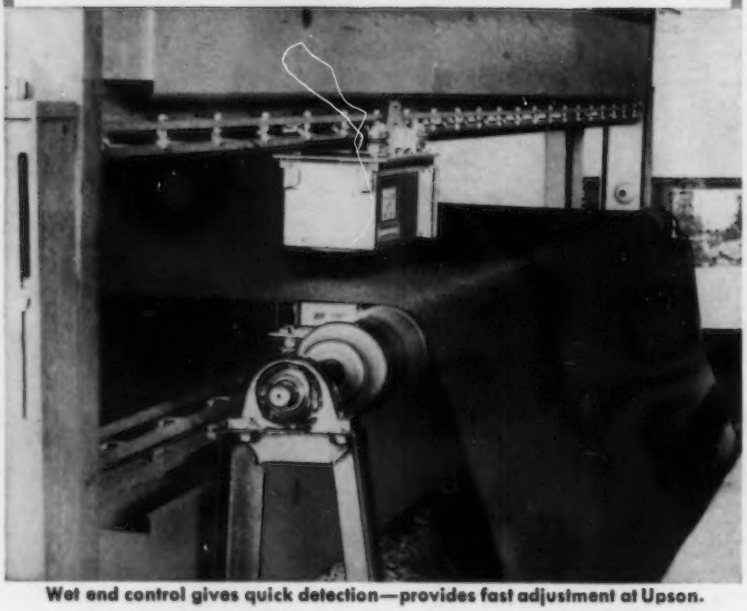
By adding an automatic cut-out switch with V-belt connection to driven shaft, motor can be stopped immediately. With the standard hub mounted on driven shaft, the switch opens the electric circuit when speed of switch falls below predetermined value.

FALK

...a good name in industry

PRODUCTION UP, "BROKE" REDUCED
AT THE **UPSON** COMPANY
WITH

CURTISS-WRIGHT
BASIS WEIGHT CONTROL SYSTEM



Wet end control gives quick detection—provides fast adjustment at Upson.

Like many other mills, the Upson Company of Lockport, N. Y. has solved the problem of maintaining uniformity in paper production without wasteful broke and production time losses by installing the Curtiss-Wright Basis Weight Control System.

The non-contacting measuring head at the wet end traverses the width of the sheet and continuously records basis weight. Variations from pre-set tolerances are instantly signalled to the automatic controller which triggers corrective action at the stock gate.

Result: Greater uniformity, increased saleable tonnage, improved drying efficiency, time saved in weight and order changes, chest run-outs and start-ups.

Find out how Curtiss-Wright Basis Weight Control Systems can improve your production with new economy. Write Industrial Controls Department, Electronics Division, Curtiss-Wright Corporation, Carlstadt, New Jersey.

Systems Frieseke & Hoepfner

Industrial Controls Department,
ELECTRONICS DIVISION
CURTISS-WRIGHT
CORPORATION · CARLSTADT, N. J.

as demand begins to catch up with supply there are apt to be some price increases, partly to compensate for substantial cost increases.

Q. What about employment levels in your industry—have you had any substantial layoffs recently? Will there be substantial hiring this Fall?

A. The inherent stability of the paper industry, as reflected by only a 3 per cent production drop since 1956, has enabled us to provide an exceptionally stable level of regular employment. There have been some minor layoffs, partly because of adverse market situations in a few fields and partly because of the industry's intensified efforts to reduce costs and to increase efficiency. But, even these adjustments have been achieved within generally stable employment levels. And I don't expect this to change much in the future.

OBITUARIES

Valentine L. Wilson, vice president and board chairman of the S. Walter Paper Co., Philadelphia, died on Oct. 6th in Pennsylvania Hospital. He was 64.

Mr. Wilson was one of the early pioneers in the decorative wrapping field.

David L. Dubin, 47, vice president of the United Paper Box Corporation, Chicago, died Oct. 6th. He was with the firm four years.

Aytch P. Woodson, one of the founders of the Masonite Corp. died on October 8th in Wausau, Wis. Mr. Woodson was chairman of the board of Mosinee Paper Mills, Mosinee, Wis. He was a director of American Box Board Co., Longview Fibre Co. and Marathon Corp. of Canada, Ltd.

Alfred H. Montville, 41, sales engineer for the Shartle Division, Middletown, Ohio of Black-Clawson Co., died at his home in Atlanta, Ga.

For the past three years Mr. Montville had represented the Shartle Division in the southern sales office of Black-Clawson, Atlanta.

Lafayette B. Curtis, 52, a 31-year employe of the Diamond Gardner Corp,. died at Middletown Hospital, Ohio.

Mr. Curtis was employed as a paper inspector in Mill 1 of the Gardner plant.

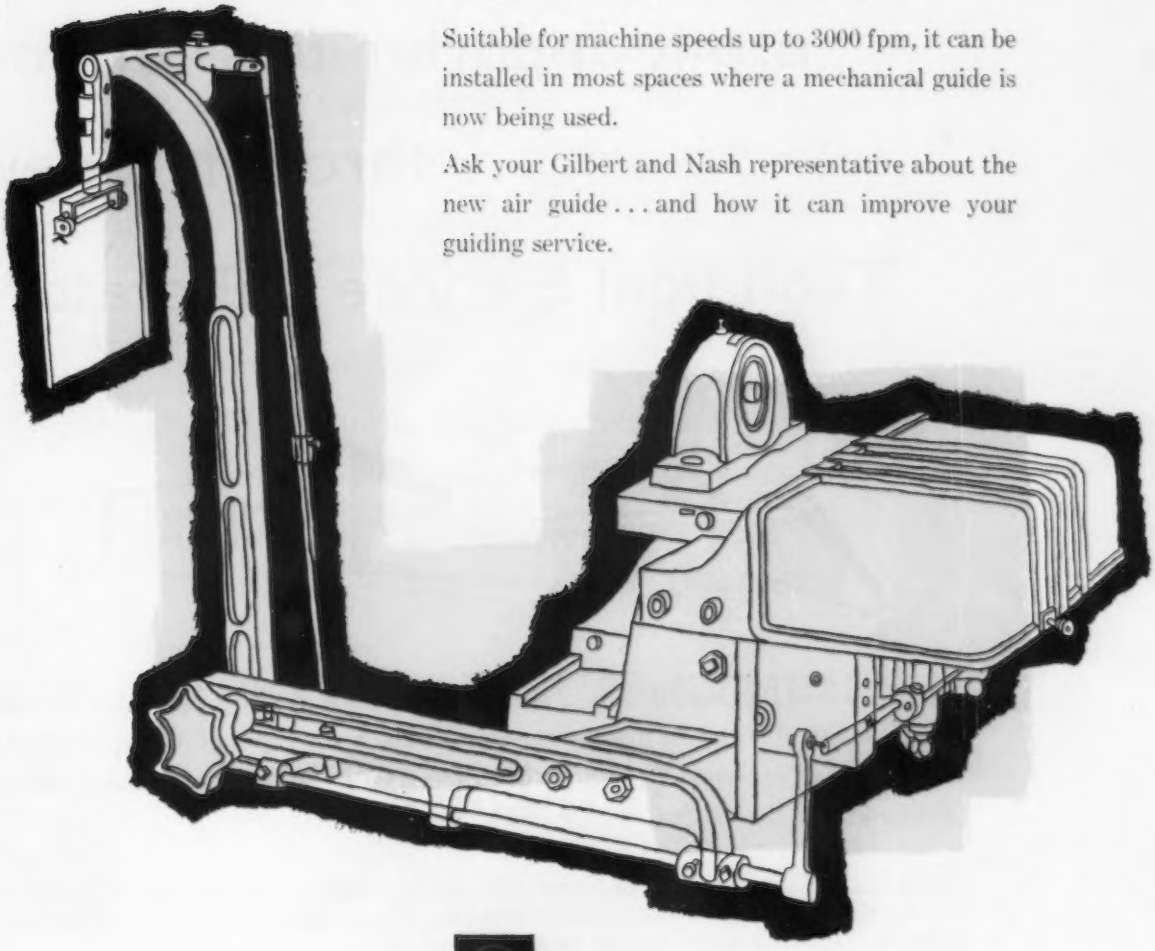
NEW AIR GUIDE FROM GILBERT AND NASH

Here's a new guiding service from Gilbert and Nash —an efficient economical air-operated guide. Simple, too, with a minimum of mechanical moving parts.

The Gilbert and Nash air guide has a constant rate of correction, regardless of machine speed. In the event of air supply failure, the guide remains stationary at the point of last correction. No springs to pull the guide roll with possible loss of wire or felt.

Suitable for machine speeds up to 3000 fpm, it can be installed in most spaces where a mechanical guide is now being used.

Ask your Gilbert and Nash representative about the new air guide . . . and how it can improve your guiding service.



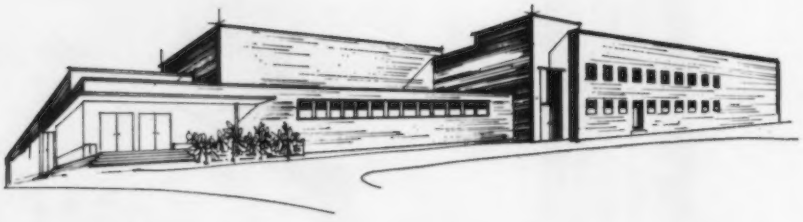
Manufactured and sold exclusively by

APPLETON MACHINE COMPANY

APPLETON, WISCONSIN

PROGRESS

...means greater profit opportunities for you through a new Technical Service Laboratory



Du Pont's new Pigment Technical Service Laboratory can help you make the most profitable use of pigments in your paper products. Skilled specialists, experienced in many facets of papermaking, utilize the most complete and modern research facilities of their kind in the solution of your problem.

• For information on Du Pont's expanded service facilities, ask your Du Pont Pigments representative or write: E. I. du Pont de Nemours & Co. (Inc.), Pigments Dept., Wilmington 98, Delaware. In Canada: Du Pont Company of Canada (1956) Limited, P. O. Box 660, Montreal, Quebec.

PROGRESS IN PIGMENTS

IN PIGMENTS

Pigments are basic—and every improvement in their properties or use can mean better, more profitable paper products for you. To Du Pont, a supplier of pigments to your industry, this is a compelling reason to maintain a program of progress in our products and service.

An important part of Du Pont's dynamic continuing program is the spirit of progress—a sensitivity to your needs and the requirements of the paper industry.

This is Du Pont Progress in Pigments—the assurance of new and improved pigments, both today and tomorrow . . . and the growing technical skills and resources with which to serve you.

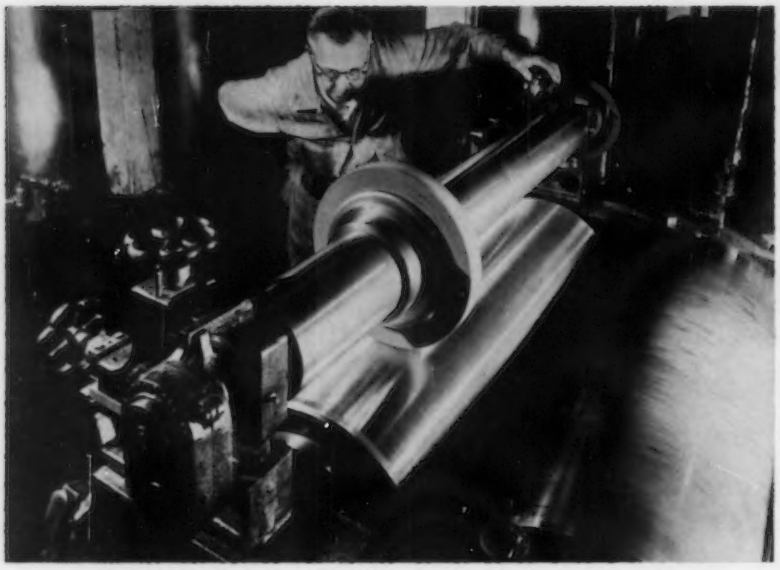
PIGMENTS DEPARTMENT

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . *THROUGH CHEMISTRY*

. . . FROM DU PONT



Grind Rolls in Place, Without Machinery Disassembly

B. S. Roy & Son, 801 Southbridge St., Worcester, Mass., have developed an "In Place" portable roll grinder for refinishing rubber, steel and iron rolls up to 100 inches wide.

The grinder is clamped to the roll's supporting frame, and is reported to redress rolls to within .00045 inch tolerences. Each grinder is engineered for a particular job, although often the same grinder can be adapted to refinish the rolls of several machines. A variety of grinding wheels are available for refinishing different materials.

Shaker Empties Railroad Cars in Minutes

A new electromechanical railroad car shaker made by the Syntron Co., 587 Lexington Ave., Homer City, Pa. is reported to unload bulk materials in record time without complications.

The unit's totally enclosed four h.p. motor is self lubricating and produces 850 powerful vibrations per minute to unload bulk materials quickly and efficiently, eliminating rodding, poking, and reducing labor costs and demurrage. The shaker has a hook type steel frame which attaches easily to gondola cars.

Maple End Grain Suction Box Cover

Appleton Wood Products, Appleton, Wis., now offers a new "Lo-Vac" end of grain suction box cover that is constructed of winter cut hard maple. The lands are supported on cross members of Reslin laminate which does not contract or expand. The cover is fully soaked and ready to place in service.

End of grain maple is reported easy on wires for it produces a wax like surface. Data sheets are available from the manufacturer.

Thermal-Release Principle Works Valve Actuator

A powerful new actuator which utilizes the expansive force of Freon vapor to position valves and other final control elements with precise and repeatable accuracy has been announced by the Swartwout Company, 18511 Euclid Ave., Cleveland, Ohio.

Called the Thermo-Drive Actuator, the new device uses no compressed air, motors, gear trains, pumps, oil, amplifiers, or relays of any kind. It develops a force of 500 lbs., (opposed by a 300-lb. return-spring force), gives a total stroke length of 1.5 inches, and a response speed of 0.1 inch per second. Precise null-balance positioning is possible at any point within the limits of the actuator.

The operating principle of the actuator is based on the controlled rate of heat release through a fluid medium, Freon, circulating in a closed chamber open only to a condenser. Within the Freon-filled chamber there is a heavy spring bellows coupled to an actuating stem and to a mechanical position-feedback device.

The Freon is continuously vaporized by an integral heater; this creates a vapor pressure within the chamber. Control action is achieved by varying the bleed rate of the Freon into the condenser through a release valve. The release valve is operated by a force coil responding to a command signal from a control instrument. When the bleed rate is decreased, the vapor pressure increases, compressing bellows and causing a downstroke. Conversely, an in-

for WHITENESS
and BRIGHTNESS
choose
LUKON
INC
384-4 WAX EMULSION SIZE
LUKON'S New 384-4 Acid Stable WAX EMULSION has been especially developed to produce a light, bright color. Comparison with ordinary wax emulsions will show a striking difference. Like all Lukon fine wax emulsions, new white 384-4 has excellent mechanical and chemical stability. It is one of a series of new light color emulsions.
Why not write for more information and technical data sheets on Lukon's Wax Emulsions.
OTHER WAX EMULSIONS
LUKON 384-4 WAX EMULSION
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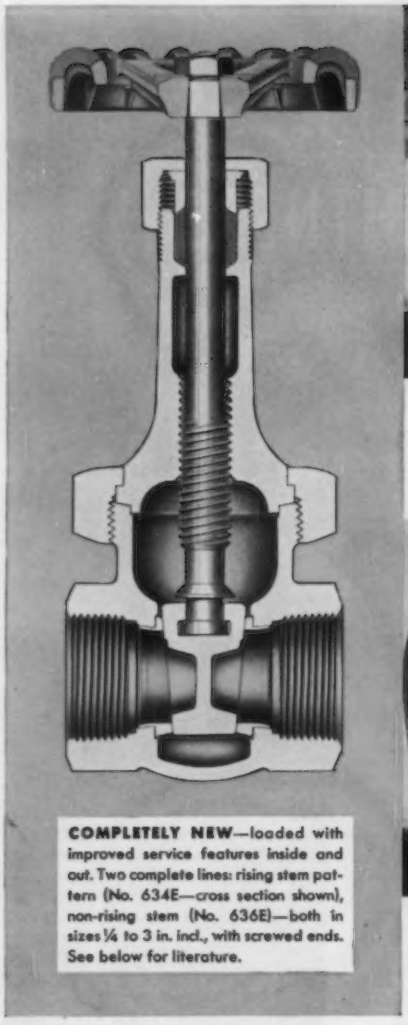
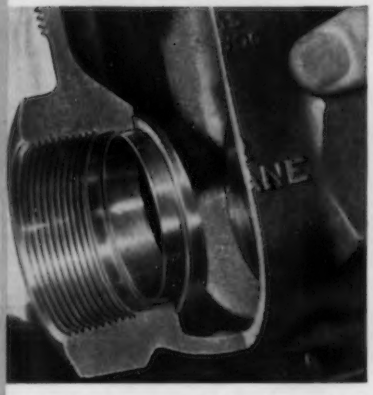


COMPLETELY NEW—loaded with improved service features inside and out. Two complete lines: rising stem pattern (No. 634E—cross section shown), non-rising stem (No. 636E)—both in sizes ¼ to 3 in. incl., with screwed ends. See below for literature.

NEW CYLINDRICAL BODY SHAPE—a proven design on high-pressure steel valves—increases strength without added bulk, distributes pressure load uniformly, resists distortion and leakage at seats.

NEW, STRONGER HEX ENDS, better integrated with body, eliminate sharp contours, give entire valve more rigidity under line strains. Wider hex faces allow firmer wrench grip for easier installation. Marring less likely.



NEW, EXPANDED-TYPE BODY RINGS insure long, tight-seating service life. They're rolled in, can't work loose. Shoulder at bottom of end threads restrains excessive entry of pipe against possible seat damage.

NEW EXELLOY, 12% chromium steel body rings give a hard bearing surface, highly resistant to wear, indentation, scoring and foreign matter damage. Easily replaced bronze disc takes the brunt of normal wear.

New design for tough service...easy maintenance

300-Pound Wedge Disc Bronze Gate Valves

Rising Stem and Non-Rising Stem Patterns

A new body shape that distributes greater strength uniformly against internal stresses and external strains . . . better integrated hex ends, huskier and wider, that add to body rigidity and give a firmer wrench grip . . . new rolled-in, high wear-resisting alloy body rings that don't work loose . . . easily renewed wedge disc—these are typical important features of new Crane bronze gate valves.

On your toughest services, these valves assure ultimate durability . . . new ease of application . . . low-cost repairability. And they're priced no higher than ordinary 300-pound integral seat bronze valves.

Easy to Repair—The Disc Takes the Wear

After long, hard service the hard Exelloy (12% chromium) body rings show no appreciable wear. Normal seating wear is taken by the bronze disc. When needed, a new disc, easily slipped onto stem, provides a practically new, tight-seating valve.

Circular Gives The Facts

For complete technical data on both rising stem and non-rising stem patterns . . . size listing, etc., get Circular AD-2340 from your Crane Representative, or by writing to address below.

CRANE VALVES & FITTINGS

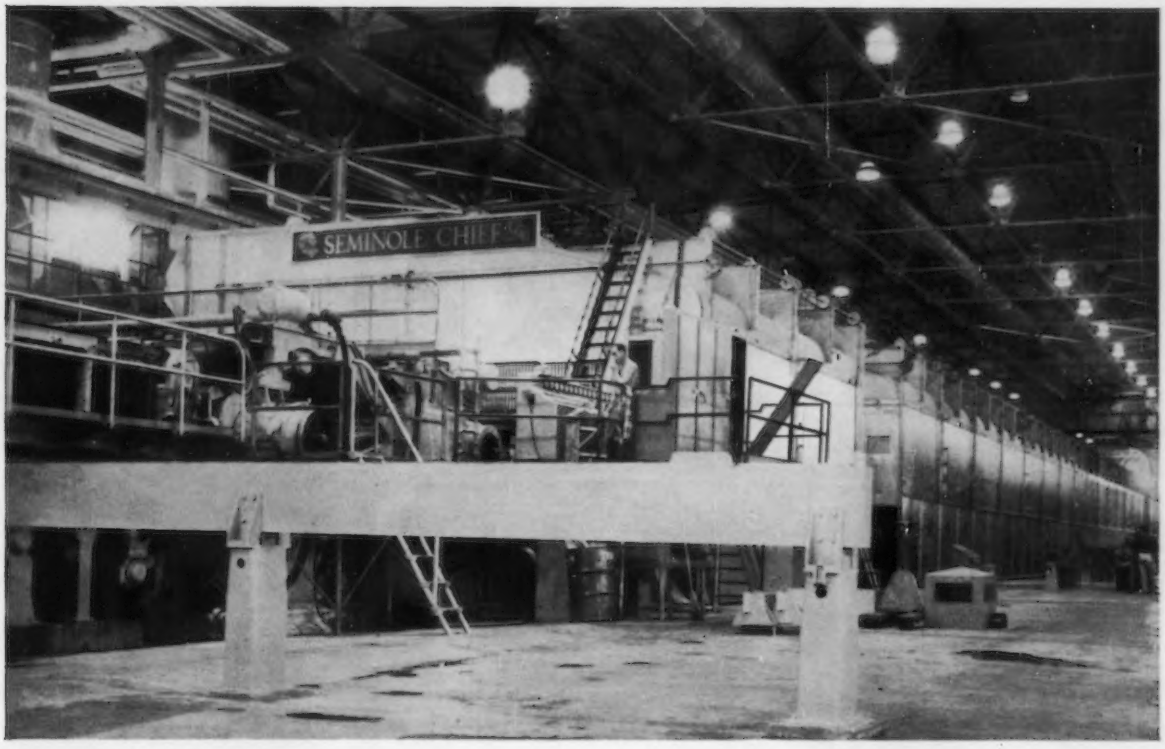
PIPE • PLUMBING • HEATING • AIR CONDITIONING • KITCHENS

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

ROLL COVERINGS

On the Seminole Chief—

50,000 square feet of paperboard per minute speed across U. S. Rubber covered rolls



The Seminole Chief produces a staggering tonnage of 1000 tons per day. Veteran papermakers are amazed at its sheer size, its up-to-the-minute equipment. St. Regis Paper Co. required the best in everything, and that meant "U.S." for the roll coverings.

One reason why paper makers specify "U.S." is *experience*. St. Regis, for example, has many years of continuous production experience with "U.S." Roll Coverings on its #1 machine.

The big reason then is the quality of the roll covering itself . . . its dimensional stability, strength and durability, chemical and water resistance, firm adherence to metal, uniform surface.

Technical service is another "U.S." feature. Factory-trained engineers, working out of local "U.S." branch offices are ready to help solve your roll-covering problems.

If you want rolls of this calibre—plus expert engineering assistance—contact roll-covering specialists either at your local "U.S." branch office, or write us at Rockefeller Center, New York 20, N.Y. In Canada, Dominion Rubber Co., Ltd.

Mechanical Goods Division

United States Rubber

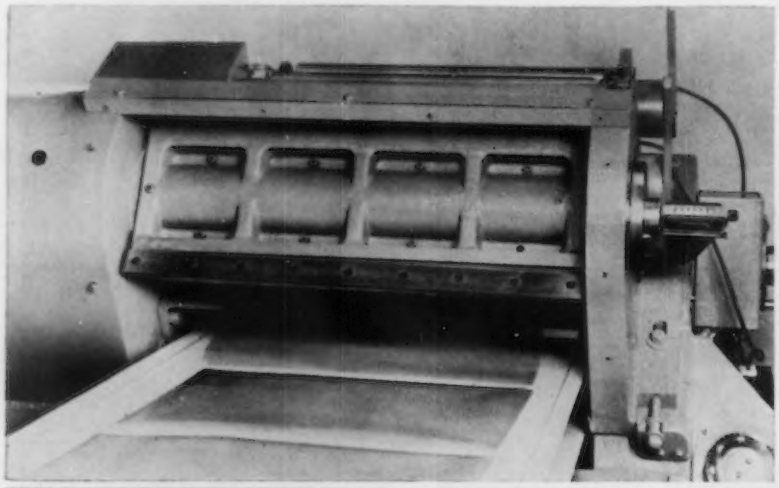
See things you never saw before. Visit U.S. Rubber's new Exhibit Hall, Rockefeller Center, N.Y.

crease in the bleed rate will permit the bellows to expand, producing upstroke. Precise positioning of the stem is assured by the built-in feedback loop. Position repeatability is accurate to 0.5 per cent.

Rotary Cutter Has Desirable Features

A new rotary cutter that can cut from rolls or in synchronization with in-process work is announced by Hobbs Manufacturing Co., 26 Salisbury St., Worcester, Mass. The cutters and slitters are available in widths from 24 to 60 inches.

Pieces from 2 inches to 60 inches long can be cut by the new machine. Among other desirable features is a provision for infinitely variable cutoff lengths, at speeds up to 50 cuts per minute. Hobbs rotary cutters can be supplied with or without a slitting device for longitudinal cutting. Accessory equipment includes unwinding stands, run-out conveyors, and stackers.



Mechanical Seals Said To Reduce Maintenance

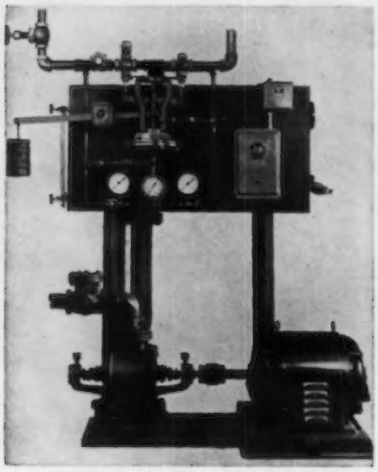
The Borg-Warner Corporation has formed a new division to manufacture, sell and service mechanical seals.

The mechanical seal is a shaft sealing device, used to replace the packing in a conventional centrifugal pump stuffingbox, or the gland of a rotating shaft. Using precision-lapped faces, it is designed to withstand extreme conditions of temperature and pressure without leakage. It is also said to eliminate the periodic down-time for repacking, as is associated with a conventional stuffingbox.

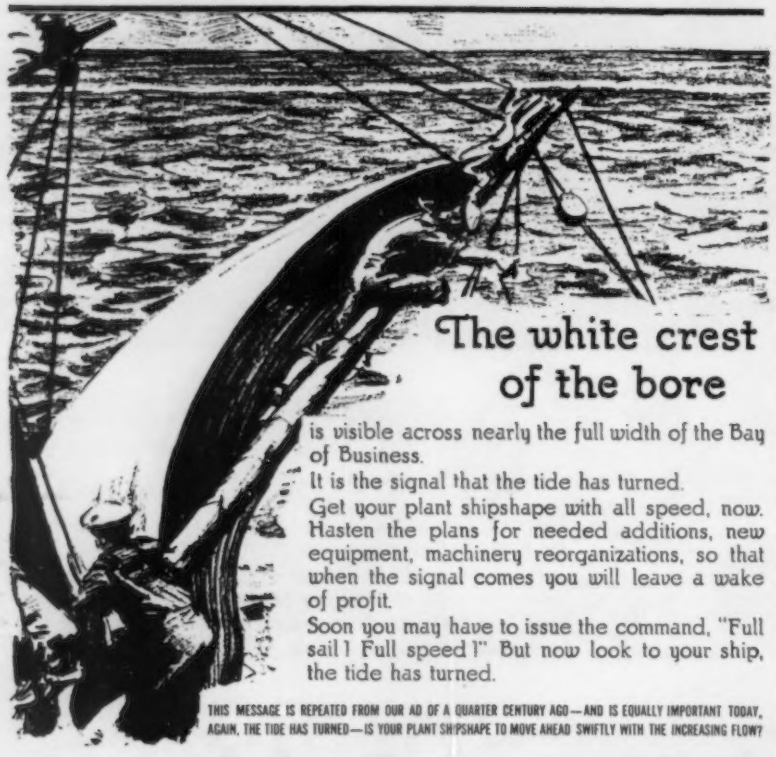
Offered as a complete line, the Borg-Warner mechanical seal, is available for all makes, models and sizes of centrifugal pumps, as well as for other rotating shaft applications.

Differential Drainage & Boiler Return System

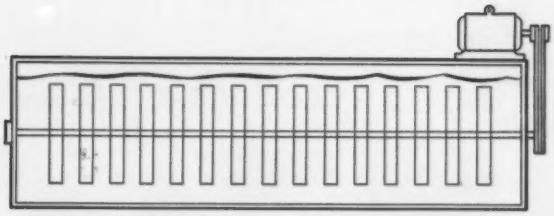
Better performance with lower operation and maintenance costs are claimed for an improved differential drainage and boiler return system offered by Stickle Steam Specialties Co., 2215 Valley Ave., Indianapolis, Ind. The system is designed for processing plants wherever steam is used for processing at pressures over 30 pounds.



The system is said to return condensate from steam processing units to the boiler at 300 degrees or higher (only 15 to 20 degrees less than the temperature at operating pressure). This is reported to lower fuel costs 10 to 25 per cent over the usual open system. Raw make-up water needs are reduced up to 90 per cent, thereby minimizing corrosion and boiler strain. An exclusive patented differential valve automatically maintains any desired differential in pressure between steam in the boiler and pressure in the system's receiver tank. The system is offered on a 60-day operating trial basis.

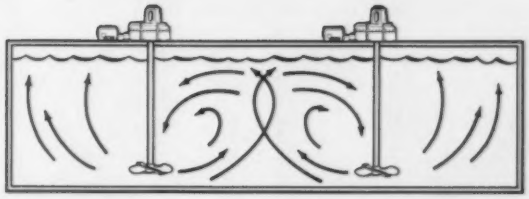

The white crest of the bore
is visible across nearly the full width of the Bay of Business.
It is the signal that the tide has turned.
Get your plant shipshape with all speed, now. Hasten the plans for needed additions, new equipment, machinery reorganizations, so that when the signal comes you will leave a wake of profit.
Soon you may have to issue the command, "Full sail! Full speed!" But now look to your ship, the tide has turned.
THIS MESSAGE IS REPEATED FROM OUR AD OF A QUARTER CENTURY AGO—AND IS EQUALLY IMPORTANT TODAY. AGAIN, THE TIDE HAS TURNED—IS YOUR PLANT SHIPSHAPE TO MOVE AHEAD SWIFTLY WITH THE INCREASING FLOW?
J. E. SIRRINE COMPANY • Greenville, South Carolina
Engineers Since 1902
A DEPARTMENTALIZED ENGINEERING ORGANIZATION SERVING • BUSINESS • COMMERCE • INDUSTRY

Look what happened when this mill stopped **sloshing** *and started* **mixing** *stock*



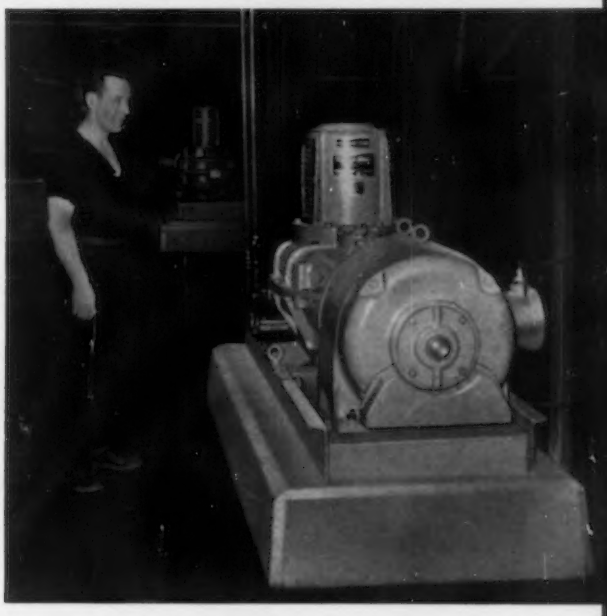
1. Familiar story? A large newsprint mill* was having a tough time getting a uniform 3½% feed of groundwood and sulfite from its mixed stock chest. The stock was churned with paddles on a horizontal shaft, in a chest 56′ long, 17′ wide, 16′ high. But the paddles were *sloshing* the stock instead of mixing it. This caused wide swings in consistency.

*Name on request



2. "Why put up with it?" said MIXCO engineers. "You can get *complete uniformity* with two LIGHTNIN Mixers that look like this. Every pound of stock will be thoroughly mixed from the instant it enters the chest. No dead areas—no stagnation—no stratification—no sudden ups and downs in consistency. What's more, we'll *guarantee* that LIGHTNINS do the job."

3. "Sounds good," said mill engineers, "but will we have to modify our chests to install these units?" "Not at all!" said the MIXCO men. "Make the whole change over one week-end. They come ready-assembled and aligned to minimize your down-time." Here's one of the two LIGHTNINS being installed. It drives a 54″ stainless steel propeller with four adjustable blades.



4. Results? "Since installing LIGHTNINS we've repeatedly beaten our best previous daily production record," say mill engineers. "Effluent is so uniform that we're better off pumping directly to the machine, bypassing a machine chest entirely. Consistency of the stock varies *less than 0.2%* between any two points in the chest at any time!"

Can you make productivity jump with this kind of mixing? More than 100 mills are doing it! No need to guess—you can get the precise power level you need to do the mixing job you want done in a given chest within a given time. It costs you nothing to find out how. For quick, competent service, call in your LIGHTNIN Mixer representative (listed in Thomas' Register). Or write us direct.

FOR LATEST MIXING INFORMATION and full description of LIGHTNIN Mixers, send for these helpful bulletins:

- ☐ NEW BULLETIN "Agitation and mixing for pulp & paper mills"—complete and helpful mixing information on stock agitation, pulping liquors, coating systems, and waste treatment (B-511)
- ☐ Laboratory and small-batch production types (B-112)
- ☐ Top or bottom entering; turbine, paddle, and propeller types: 1 to 500 HP (B-102)
- ☐ Top entering; propeller types: ¼ to 3 HP (B103)
- ☐ Side entering: 1 to 25 HP (B-104)
- ☐ Portable: ⅛ to 3 HP (B-108)
- ☐ Condensed catalog showing all types (B-109)
- ☐ Quick-change rotary mechanical seals for pressure and vacuum mixing (B-111)
- ☐ Data sheet for figuring general mixer requirements (B-107)

Check, clip, and mail with your name, title, company address to:

MIXING EQUIPMENT Co., Inc., 172-k Mt. Read Blvd., Rochester 3, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont., Can.

Lightnin® Mixers

MIXCO fluid mixing specialists

PRICES OF FIBERS

MARKET WOOD PULP

FOURTH QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

	Delivered Basis U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	§$90.00/ —	§$80.00/ —	§$90.00/ —
Bleached Gw'd	$97.50/100.00	$97.50/100.00			
Kraft, Blchd.	157.00/ —	160.00/162.50	§157.00/162.50*		§157.50/ —
Kraft, Blchd. Hdwd.	152.00/ —		§137.00/ —		
Kraft, Semi-bleached	140.00/ —	140.00/ —			
Kraft, Unbl.	117.50/125.00	125.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd.	155.00/ —	155.00/ —	*155.00/ —	*155.00/ —	155.00/ —
Sulphite, Bl. Hdwd.	150.00/ —				
Sulphite, Unblchd.	135.00/ —	135.00/ —	†135.00/ —	*135.00/ —	
Sulphite, Unb'l. Gl'sn		134.00/ —	†134.00/ —		
Soda, Blchd.	147.00/150.00	150.00/ —			

§ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances

NEW YORK RAG MARKET

PRICES NOMINAL

New Domestic Cotton Cuttings

Delivered Mill Basis

	Per 100 lbs.
No. 1 White Shirts	$13.50/$14.50
No. 1 Unblchd. Muslins	16.00/ 17.00
Blchd. & Unblchd. Underwears	15.00/ 16.00
No. 1 Light Cream Silesias	12.50/ 13.50
No. 1 Blue Overalls	8.00/ 9.00
Percales	5.50/ 6.00
No. 1 Light Prints	5.00/ 5.50
Suntan Khakis	5.75/ 6.75
Cottonades	3.00/ 3.50
No. 1 Washables	2.50/ 3.25

Old Domestic Cotton Rags

Delivered Mill Basis

	Per 100 lbs.
Mixed White	$3.25/$3.75
Cotton Pants & Overalls	2.25/ 2.75
Twos and Blues, Repacked	2.00/ 2.50
No. 2 Roofing	.65/ .80

COTTON LINTERS

Memphis Market

f.o.b. Oilmills

Week Ended Oct. 10		Per 100 lbs.
Grade 1	n. a.	
2		
3		$8.50/ $7.25
4		6.75/ 6.25
5	1 cut—felting	5.75/ 5.25
6		4.75/ 4.25
7		4.00/ 3.50

* Based on 73% cellulose.

OLD ROPE & BAGGING

(Prices to Dealers, f.o.b. N.Y.)

	Per 100 lbs.
New Burlap Cuts	$4.50/$5.50
Scrap Burlap	3.50/ 4.25
Australian Wool Pouches	5.00/ 5.50
Gunny	4.50/ 5.00
No. 1 Domestic Manila Rope	6.25/ 7.50
No. 1 Foreign Manila Rope	5.25/ 6.25
Domestic Sisal Strings	4.00/ 4.50

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York Oct. 13	Boston Oct. 13	Chicago Oct. 13	Los Angeles Oct. 13
No. 1 Mixed Paper	$12.00/ 13.00	11.00/ 14.00	9.00/ —	14.00/ —
No. 1 News	18.00/ 19.00	17.00/ 18.00	20.00/ —	15.00/ —
Overissue News (Lg. size)	20.00/ 23.00	18.00/ 20.00	25.00/ —	19.00/ —
Mill Wrappers	19.00/ 22.00	16.00/ 18.00	12.00/ —	14.00/ —
Old Corrugated Containers	26.00/ 27.00	25.50/ 26.00	27.00/ —	25.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	35.00/ 40.00	40.00/ —	45.00/ —
New Double Kr. Ld. Corr. Cuts	40.50/ 40.00	40.00/ 42.50	42.50/ —	30.00/ 35.00
(Semi-chem. medium)	45.00/ 50.00	45.00/ 50.00	45.00/ 50.00	35.00/ 36.00
New 100% Kraft Corr. Cuts	50.00/ 55.00	50.00/ 55.00	57.50/ —	45.00/ —
New Br. Kraft, Env. Cuts	70.00/ 75.00	70.00/ 75.00	52.50/ —	50.00/ 55.00
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	52.50/ —	55.00/ 60.00
New Br. Kr. Bag Waste Unprintd	60.00/ 65.00	65.00/ 75.00	62.50/ —	55.00/ 60.00
No. 1 Groundwood Shvs.	25.00/ 30.00	25.00/ 30.00	22.00/ —	30.00/ 35.00
White Newsblanks	60.00/ 65.00	55.00/ 60.00	40.00/ —	55.00/ —
No. 1 Soft White Shvs.	60.00/ 65.00	60.00/ 65.00	55.00/ —	— / —
Super Soft White Shvs.	65.00/ 75.00	75.00/ 85.00	65.00/ —	— / —
Hd. White Shvs.	90.00/ 95.00	95.00/105.00	85.00/ —	85.00/ 90.00
Hd. White Env. Cuts	105.00/110.00	110.00/115.00	90.00/ —	100.00/110.00
Col. Tab. Cards	55.00/ 60.00	55.00/ 60.00	32.50/ —	27.50/ —
Manila Tab. Cards	85.00/ —	75.50/ 85.00	75.00/ —	65.00/ —
No. 1 Col. Ledger	32.50/ 37.50	30.00/ 35.00	45.00/ —	27.00/ —
White Ledger	60.00/ 62.00	57.50/ 62.50	57.50/ —	55.00/ —
Mixed Book & Mag.†	20.00/ 23.00	18.00/ 21.00	14.50/ —	— / —
No. 1 Books‡	25.00/ 30.00	25.00/ 30.00	32.50/ —	— / —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

PRICES OF MATERIALS

Aluminum sulphate:		
grd. coml. bulk, c.l. wks.	cwt.	$2.00 / —
iron-free, bgs., c.l. wks.	cwt.	3.80 / —
Casein, acid prec.:		
dom. sh. pt. c.l., (30 mesh)	cwt.	56.00 / —
Agr. ex dock	cwt.	19.00 /19.50
New Zealand	cwt.	23.25 /24.00
Caustic soda:		
c.l. wks. solid, 76%	cwt.	4.80 / —
flak. & grd. drums, c.l.	cwt.	5.20 / —
liquid 50% tanks		2.90 / —
liquid 73% tanks		3.60 / —
China Clay		
dom., dry-grd., airfloat:		
325 mesh bgs., c.l. Geo.	ton	10.00 /12.00
300 mesh, bgs., c.l. Geo.	ton	13.50 /14.50
imp., white, lump, c.l. ex. dock		20.00 /35.00
Chlorine:		
single-unit tanks, works	cwt.	3.15 / —
multiple unit, 2-5 cars per yr.		5.75 / 4.05
Lime:		
hydrated, bulk, c.l. works	ton	17.25 / —
quicklime, bulk, c.l. works	ton	14.25 / —
Gum rosin:		
K. M. N. drums, c.l. Savan,	cwt.	7.80 / 8.00
Rosin size:		
70%, gum & pale paste, tank cars, south, sh. pt.	cwt.	7.51 / —
Saltcake:		
dom. bulk, 100% anh. wks.	ton	28.00 / —
Soda ash:		
light, 58% ash bags, wks.	cwt.	1.85 / —
bulk, c.l. wks.	cwt.	1.55 / —
Sodium chlorate:		
drums, c.l., wks.	cwt.	9.00 / —
drums, l.c.l., wks.	cwt.	9.50 /10.50
Sodium peroxide:		
dms., c.l. E. of Miss.	lb.	.20½ / —
l.c.l. (same basis)		.21 / .21½
Sodium silicate, 40° Be.:		
tank-cars, wks.	cwt.	1.20 / —
drums, c.l. wks.	cwt.	1.55 / —
47° Be. WW.		
tank-cars, c.l. wks.	cwt.	1.90 / —
drums, c.l. wks.	cwt.	2.25 / —
Soybean, protein:		
chem. isol., wks. c.l. bags	lb.	.19 / .23
Starches:		
Corn, multiwalls, c.l. prod. plant:		
pearl	cwt.	6.49 / 6.75
white, dextrins	cwt.	8.08 / 8.20
chlorinated	cwt.	8.25 / 8.35
potato, Idaho, c.l. wks.	cwt.	5.80 / —
East, fr. all. 50 cents cwt.		
potato, Maine, c.l. wks.	cwt.	6.00 / —
Sulphuric acid:		
60° Be. cbys. c.l. wks.	cwt.	2.00 / —
l.c.l. wks.	cwt.	2.30 / —
tank-cars, wks.	ton	18.60 / —
Sulphur:		
crude, c.l. mines, contract,	long ton	23.50 / —
f.o.b. vessels Gulf dock	ton	25.00 / —
Sulphur dioxide:		
liquid, coml cyl., wks.	lb.	.10 / .12
multi-unit cars, wks.	lb.	.0535/ —
Talc, fibrous grd., bags:		
c.l. wks., N.Y.	ton	28.00 / —
l.c.l. wks., N.Y.	ton	31.00 /36.00
Titanium dioxide:		
anatase, c.l. dlvd. E. bags	lb.	.25½/ —
l.c.l. dlvd.	lb.	.26½/ —
rutile, c.l. dlvd.	lb.	.27½/ —
l.c.l. dlvd.	lb.	.28½/ —

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3. Keeps entire system clean — helps prevent slime deposits.
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What's more, d-i LESTOIL promotes rapid and complete defibering of paper stock, and helps keep your felts, wires and your entire system whistle-clean.

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NEW LITERATURE

Air Magnetic Control for Tube Expanding

Describes the operation and specifications of two new air-driven models, and shows a complete line of tube expanders and accessories. Bulletin Y-53. Elliott Co., Springfield, Ohio.

Chemical Process Equipment

Discusses product upgrading, by-product recovery of valuable materials, and processing methods. Also contains a section on what the latest methods of chemical processing can mean to industry. Bulletin WC-120. Graver Water Conditioning Co., 216 West 14th St., New York 11, N. Y.

Flexring Couplings

Includes diagrams and tables on these couplings which come in four sizes for light horsepower applications up to 1000 r.p.m. Bulletin 61. John Waldron Corp., New Brunswick, N. J.

McKay Debarker Chain

Illustrates and gives a clear concise explanation of the debarking operation. Also provides specifications for this chain which is carburized to give longer service. McKay Co., 1005 Liberty Ave., Pittsburgh 22, Pa.

Magnetic Tape Spacer Cutter

Describes in detail the operation and production advantages of the Regent magnetic tape spacer cutter. Lawson Co., 2011 W. Hastings St., Chicago 8, Ill.

Nopco Wax Sizes

Discusses four series of wax and rosin-wax sizes for the paper and board industries, together with their uses in internal and surface sizing and in coating colors. Booklet. Paper Chemicals Div., Nopco Chemical Co., 60 Park Pl., Newark, N. J.

Researching Tomorrow's Paper Coatings

Introduces Dewey and Almy to the paper industry and reviews in detail the properties of their new paper coating emulsions, including Everflex MC-300. 15-minute audio-filmstrip. Dewey & Almy Chemical Div., W. R. Grace & Co., 62 Whittemore Ave., Cambridge 40, Mass.

Slide Selector for Liquid Level Gages and Valves

Condenses a wealth of specifications, sizes and other data in an easy-to-use form. Available to engineers, designers and specifiers. Jerguson Gage & Valve Co., 80 Adams St., Burlington, Mass.

Recorders, Recording Controllers and Indicators

Describes features, contains application data and specifications, shows outline and mounting dimensions, and includes photographs of all equipment. Bulletin GEA-6792. General Electric Co., One River Rd., Schenectady 5, N. Y.

Wood Pulp Statistics

256 p. Book. Price $10.00. This is an historical record of the trend of wood pulp supply and demand in the major producing

and consuming countries of the world. Compiled from widely scattered sources, it brings together, in a single book, information basic to an understanding of world pulp and paper markets. United States Pulp Producers Assn. Inc., 122 E. 42nd St., New York 17, N. Y.

OPW Stainless Steel Kamloks

Provides illustrated sales copy for their use wherever a quick coupler is needed. Also includes service recommendation chart and dimensional drawings. Catalog F-10-R. OPW-Jordan, 6013 Wiehe Rd., Cincinnati 13, Ohio.

Inverted-Y Electrification

Covers crane and runway electrification for general industrial usage requiring currents of 500 to 1200 amperes. The equipment includes fittings and current collectors for conductor systems mounted on either wall or ceiling. Booklet 1. Cleveland Crane & Engineering Co., Wickliffe, Ohio.

Ross High Pressure Closures

Presents the redesigned high pressure closures for Ross feedwater heaters and other high pressure, high temperature exchangers. Bulletin 201.1Kl. Ross Heat Exchanger Div., Buffalo 5, N. Y.

Westinghouse Synchronous Motors and Controls.

Presents a quick summary of types and features of motors and controls. The material includes a discussion of power factor correction; factors to consider in selecting the motor; and special application problems. Booklet B-7292. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

Sunoco Waxes

Describes microcrystalline and fully refined paraffin waves and includes information on properties, emulsions, testing methods and packaging. Also charts provide data on penetration, viscosity, density and solubility at various temperatures. Bulletin 22 (Revision 2). Sun Oil Co., Industrial Products Dept., 1608 Walnut St., Philadelphia 3, Pa.

Long Test Ammeters

Pictorially illustrates eight types of instruments and gives detailed information on selection, ordering and their use. Catalog. Columbia Electric Mfg. Co., 4519 Hamilton Ave., Cleveland 14, Ohio.

VibrJoint Threaded Wire-Reinforced Neoprene Pipe

Four data sheets contain specifications, prices and installation instructions for their flexible, vibration-absorbing wire-reinforced neoprene pipe joints in both threaded and flanged types. La Favorite Rubber Mfg. Co., Hawthorne, N. J.

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You get immediate shipment from one of four strategically located Diamond plants. Fast, efficient, dependable service for the chlorine you need.

Ask about these other Diamond Chemicals too:

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Diamond Soda Ash . . . 58% light and dense—delivered as you want it, from carloads to trainloads, in bags or bulk.

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Chlorine-Caustic Soda Plants: Edgewood, Md. • Deer Park, Tex. • Muscle Shoals, Ala. Painesville, Ohio.

Diamond Chemicals®

Lucien Buck

Albany Felt Co. announce that Merton H. Rubeck and George G. Marsanskis have recently been appointed service engineers. Mr. Rubeck, who joined the firm in 1947, is a specialist in multicylinder board and roofing machines. For five years, prior to his present assignment, he was a senior designer in the design department. He will continue to maintain his headquarters in Albany, N. Y.

Mr. Marsanskis, who recently completed an extensive mill and field training program with the Albany concern, will concentrate primarily on felt problems in asbestos-cement mills. Formerly superintendent of Eastern Corporation's paper mill in South Brewer, Maine, Mr. Marsanskis is a University of Maine graduate with a chemical engineering degree.

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R. W. Raas

Edmund A. Stec

John Waldron Corp., subsidiary of Midland-Ross Corp., New Brunswick, N. J. announced the appointment of R. William Raas as sales engineer in its machinery division. Mr. Raas will make his headquarters at the home office in New Brunswick.

Edmund A. Stec has been appointed to the sales engineering staff of Waldron. He will work out of the Chicago office.

The Corporation also announces the move of its Chicago office personnel to a new office building just completed in Mount Prospect, Ill., a suburb of Chicago.

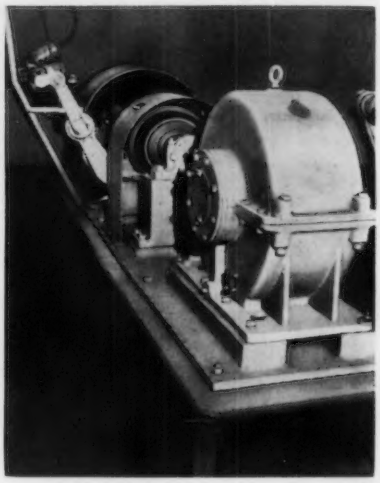
Dow Chemical Co. report that first commercial shipments of liquid chlorine and 50 per cent and 73 per cent caustic soda were made October 1 from Dow's new plant at its Louisiana Division at Plaquemine, on the Mississippi River.

The plant, operating as part of Dow's new chemical complex 10 miles south of Baton Rouge, will provide faster and more convenient service to markets in the southeastern and central states, according to Donald K. Ballman, Dow director of sales.

Proctor & Schwartz, Inc., Philadelphia, Pa., manufacturers of Industrial Drying Equipment, announce the appointment of Lucien Buck as project engineer on a new equipment program which will require his close association with the pulp, paper and allied industries regarding their drying problems and dryer requirements.

Mr. Buck has been associated with The Champion Fiber Co., Eastman Kodak Co., Parana Paper Co., and Rogers Paper Manufacturing Co., hence was chosen for this important assignment.

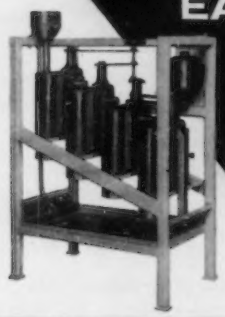
Elliott Co.'s new district manager in Buffalo is K. M. Grover. Three years ago, he joined Elliott after accumulating seven years of experience in industry. Mr. Grover specialized in refinery and petro-chemical service and application engineering.



Moore & White Co. has recently finished installing five new spiral bevel drives for the Morris Paper Board Co. of Paterson, N. J. The new drives have replaced the old open (wood filled) drives that have been a major maintenance problem for Morris since their installation.

Four of the new drives are being used on the drying section and the other is driving the calender stack. (The horsepower of the drives range from 50 to 75 hp depending upon the work load).

STOCK CONTROL MADE EASY



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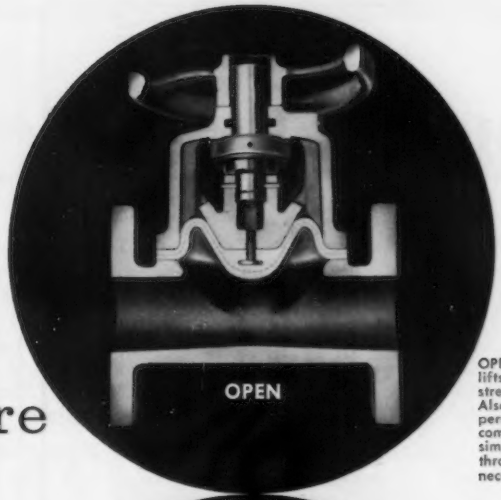
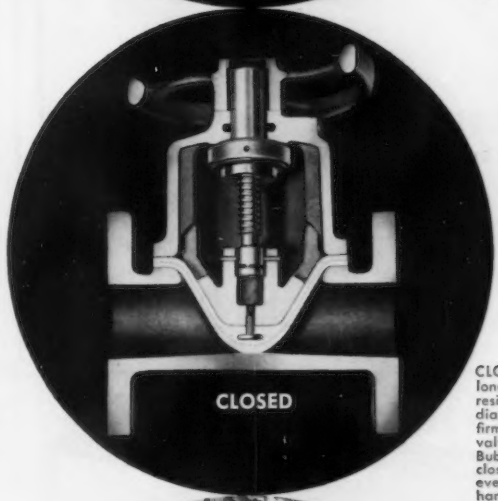
Maximum flow, minimum turbulence, negligible pressure drop!



OPEN Diaphragm lifts high for streamline flow. Also, valve design permits comparatively simple rodding through, when necessary.



CLOSED Despite long usage, resilient diaphragm seals firmly against valve body. Bubble-tight closure is assured, even when handling gritty or fibrous materials.

GRINNELL-SAUNDERS STRAIGHTWAY DIAPHRAGM VALVES* are unsurpassed for handling viscous materials — semifluid foods, latex, magmas; solids in suspension — slurries, pulp stock, sludges; fluid-borne abrasives; corrosive chemicals.

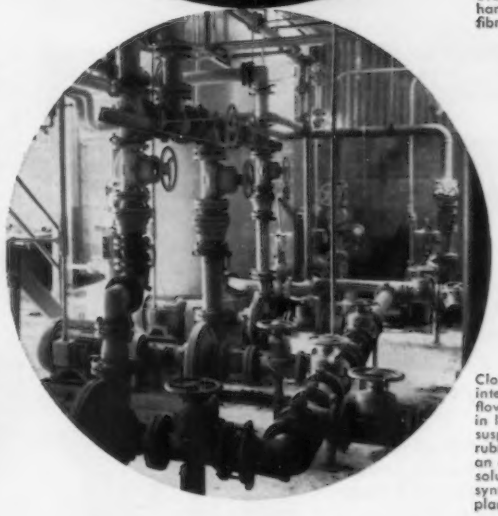
The straight-through design eliminates pockets, gate trenches and other obstructions which can trap solids. The result is maximum flow, minimum turbulence, and negligible pressure drop for a diaphragm valve.

The straight-through design also has the advantage of causing very little basic change in the direction of the fluid stream, thus reducing abrasive action from high velocity particles.

These advantages are in addition, of course, to benefits normally associated with the use of diaphragm valves . . . such as freedom from corrosion and clogging of working parts, since these are completely sealed off by the diaphragm; prevention of product contamination; elimination of stem leakage and routine maintenance, because there are no packing glands. Also, when properly pitched, lines are self-draining.

Grinnell-Saunders Straightway Diaphragm Valves are available in a choice of body sizes and materials, linings and diaphragms. Handwheel or power operated. For complete information, write Grinnell Company, Inc., 277 West Exchange St., Prov. 1, R. I.

*Patented



Clogging and interruption to flow is prevented in lines handling a suspension of rubber particles in an acid brine solution at this synthetic rubber plant.

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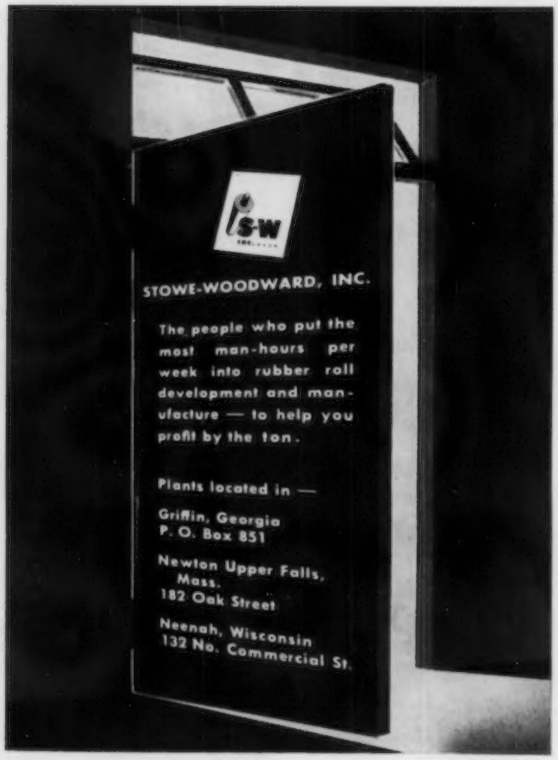
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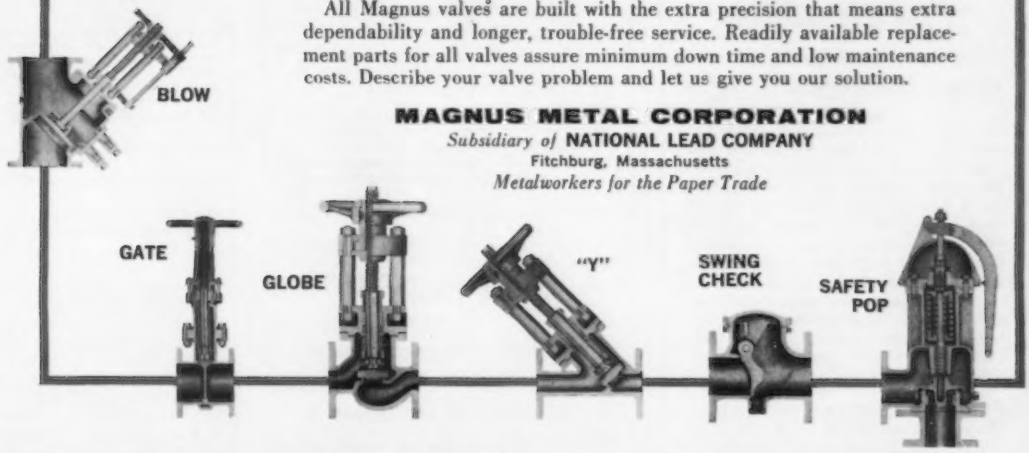

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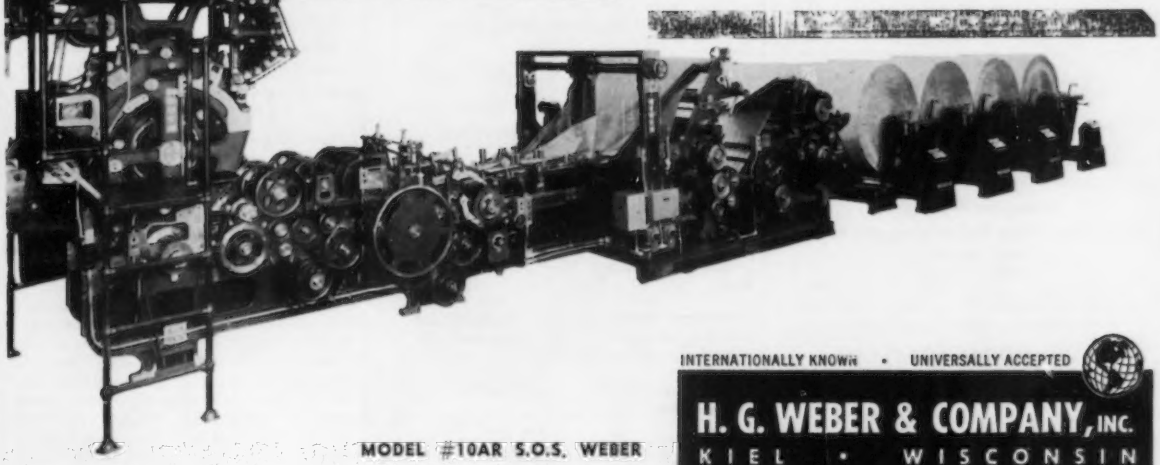

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Chemical Engineer required for Process Engineering position in Southern mill producing quality bleached papers and board. Send resume of experience to

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Located in pleasant New Jersey community.

Degree not necessary—only the ability and practical background for independent design of converting machinery.

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Manager of operations for pulp and paper manufacturing organization in the East. Technical education and training required with at least ten years practical experience. Excellent opportunity. Write giving full resume, education, and general background. Associated Industrial Consultants, 344 West State Street, Trenton, New Jersey. 0-20

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6—1500 lb Dilts; 50" x [illegible] stainless rolls
1—1500 lb Jones Bertram w/air control & washer; 72" x 63" roll.

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1— 82" Lobdell 5 roll.
1— 86" Lobdell 5 roll.
1—86" P & J 7 roll.
2—115" B-C 7 roll.
1—124" B-C 5 roll
1—124" B-C 6 roll
1—128" Downingtown 7 roll

CHIPPERS
1—96" Murray 6 knife; A-F Brng.

CYLINDER MOLDS
2— 63" face x 36" dia w/rubber couches
1— 72" face x 48" dia
1— 73" face x 48" dia
1— 92" face x 30" dia
1—102" face x 36" dia
2—104" face x 36" dia
1—107" face x 48" dia; A-F Brng
2—111" face x 36" dia; A-F Brng
1—132" face x 36" dia; A-F Brng
1—132" face x 42" dia; A-F Brng
1—136" face x 54" dia; SS covering

CYLINDER WET ENDS
1— 99" face x 48" dia Downingtown single cylinder; 18" dia couch
1—132" face x 36" dia Beloit seven cylinder; 18" dia couches & four sets of presses

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2—2' x 3' Seybold w/motor.

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16" Dia.: 2—46" face w/Accessories.
18" Dia.: 1—90" face w/A-F Brng.
24" Dia.: 39—46" face; Chrome plated.
28" Dia.:
3—70" face w/gears & bearings
3—73" face w/gears & bearings.
3—74" face w/gears & bearings.
3—77" face
2—84" face.
2—160" face w/rope carriers.
36" Dia.:
1—42" face.
2—44" face.
2—46" face.
4—70" face w/gears & bearings.
11—72" face w/gears & bearings.
1—74" face Lukenweld w/A-F Brng.
1—74" face w/gears & bearings.
3—75" face w/gears & bearings.
9—76" face w/gears & bearings.
1—77" face w/gears & bearings.
1—78" face w/gears & bearings.
20—78" face; complete section.
2—80" face.
5—84" face.
1—92" face.
1—104" face.
1—138" face.
10—160" face.
42" Dia.:
1—110" face.
1—120" face.
1—160" face.
48" Dia.:
58—46" face; chrome plated.
1—52" face w/gears & bearings.
1—82" face w/gears & bearings.
5—90" face w/gears & bearings.
10—100" face w/bearings.
25—110" face w/gears, frames & bearings.
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1—128" face.
1—130" face.
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60" Dia.:
2—113" face.

DRIVES
Various 2 hp thru 150 hp Reeves, PIV, etc.; open & enclosed; parallel & rt angle; horizontal & verticle

EMBOSSERS
1—80" Hudson Sharp; A-F Brng

EXTRACTOR ROLL
1—134" face x 24" dia Downingtown w/18" dia rubber couch

FILTERS—STEEL VATS
1— 6' face x 3' dia Dorr-Oliver
1—10' face x 8' dia Dorr-Oliver continuous
3—14' face x 8' dia Oliver Kraft Stock Washers

FLAT SCREENS
1—10 Plate IMPCO w/dunbar drive & bronze vat
7—12 Plate Beloit w/witham fasteners
2—12 Plate IMPCO w/braemer controls

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1—106" Valley complete from head box through 22" dia. suction couch.

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1—Appleton #2 w/A-F Brng & SS filling
1—Smith & Winchester w/granite filling
1—Jones #4 Imperial w/A-F Brng & SS filling
2—Appleton #1; A-F Brng.

MOTORS—3 PH. 60 CYCLE
1—100 hp GE; 440 v; 695 rpm
3—100 hp GE; 440 v; 435 rpm
3—150 hp GE; 440 v; 435 rpm
1—300 hp West; 440 v; 388 rpm
1—350 hp GE; 2200 v; 720 rpm; Synch

PUMPS
Various open & inclosed impellor centrifugal

REELS
1— 86" Downingtown two bowl
1— 94" Downingtown two bowl; 60" dia rolls
1—100" Kohler automatic two arm unwind reel; 60" dia rolls; new condition
1—150" B & S pope type w/Reliance drive

REFINERS
2—#1 Claflin; A-F Brng
1—#1 Dilts Hydrafiner w/motor & S.S. filling
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Various rolls of all types and sizes

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1—64" Dillon
1—80" B-C heavy duty board model
1—87" Hamblet w/backstand & layboy
1—157" Masson-Scott; like new

SHEETERS—SINGLE KNIFE
1—49" Hamblet
1— 54" Hamblet w/layboy & backstand
1— 60" Hamblet w/backstand
1—60" Hamblet w/layboy & backstand
1—65" Hamblet w/backstand
1— 65" Kidder Spot Sheeter w/elec. eye
1—71" Hamblet
1—82" Hamblet w/layboy & backstand
1—100" Hamblet w/backstand
1—100" Hamblet w/3 pile layboy
1—110" Hamblet
1—124" Cameron quick change slitter assembly

SLITTERS & WINDERS
3— 12" Schultz Types AS & LDX
1— 40" Fales Model B; 18" dia rewind
2— 42" Essex duplex; 30" dia rewind
3— 42" Cameron Model 6; 24" dia rewind
1— 42" Cameron Model 40-1A; 22" dia rewind
2—48" Langston duplex; 24" dia rewind
1—50" Cameron Model 6; 24" dia rewind
1— 52" Cameron Model 24-2A; 18" dia rewind
1— 60" Hudson-Sharp; plastic coated paper
1— 60" Langston; shear cut; 30" dia rewind
1— 60" Kidder Model SH; 40" dia rewind
3— 62" Cameron Model 6; 24" dia rewind
1—62" Cameron Model 8; heavy duty
1—62" Cameron Model 6; 30" dia rewind
1— 62" Cameron Model 6; new 1951; 24" dia re.
1— 64" Cameron Model 8; 36" dia rewind
1—70" Center Winder w/variable speed motor.
1— 72" Cameron Model 26-3A duplex.
1— 72" Beloit shear cut; 40" dia rewind
1— 72" Hudson-Sharp high speed automatic
1— 84" Langston shear cut; 50" dia rewind
1—110" Cameron Model 18; 60" dia rewind
1—124" Cameron quick change slitter assembly
1—148" Langston shear cut; A-F Brng; 60" dia rewind
1—194" Cameron Model 19; A-F Brng

STEAM TURBINE—PAPER MACHINE DRIVE
1—100 hp DeLaval w/reducer

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1—116" drilled face x 18" dia Sandusky
1—122" drilled face x 18" dia Sandusky
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1—135" drilled face x 22" dia Sandusky
1—192" drilled face x 30" dia Millspaugh

SUCTION PRESS ROLLS
1— 90" drilled face x 18" dia Sandusky
1— 98" drilled face x 18" dia Sandusky
1—166" drilled face x 19" dia Millspaugh; used 2 mos; A.-F. Brng; rubber covered.
1—194" drilled face x 30" dia Millspaugh

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1—63" Norwood 7 roll; A-F Brng.
1—65" Norwood 7 roll; A-F Brng.
1—92" Norwood 7 roll w/drive

THICKENERS
1— 92" face x 36" dia cyl w/rubber couch; less vat
6—132" face x 36" dia cyl w/16" dia rubber couches; A-F Brng
1—132" face x 42" dia cyl w/16" dia rubber couch; A-F Brng

TRIMMERS—POWER BACK GAUGES
1—74" Seybold 20th Century
1—84" Seybold 12Z
1—84" Seybold Dayton w/motor
1—94" Seybold Precision w/motor & air table

VACUUM PUMPS
2—H-4 Nash w/10 hp motors
1—L-4 Nash
1—L-5 Nash
1—H-8 Nash
1—#3 Nash w/25 hp motor
4—#2, #3 & #6 Nash Hytors
1—7 x 10 Connersville

VOITH INLETS
2— 86" Valley Iron Works
1—108" Valley Iron Works.
1—144" B & S high speed w/headbox; SS clad
1—156" New Valley w/36" headbox; monel lined

YANKEE DRYERS
1—132" face x 10' dia Beloit; 35 psi
1—140" face x 12' dia Beloit; 75 psi

WAXERS & COATERS
1—54" Mayer w/motor
2—62" Mayer w/motors
1—65" Mayer w/drive
1—76" Mayer w/Dowtherm system

Help Wanted

CELLULOSE RESEARCH CHEMIST

MS or BS, with education or experience in field of pulp, paper or cellulose derivatives. Rush details of education, experience and personal data together with recent photograph to

Personnel Director
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WANTED

Technical man with practical experience in Bagasse and Straw Pulp making, able to take complete charge of pulp mill in Mexico. Send full particulars to Box 58-262 LOCKWOOD TRADE JOURNAL CO. INC., 15 W. 47th Street, New York 19, N. Y.—U.S.A. N-10

We have an opening in new product and technical service work, at our Naugatuck Connecticut laboratories. This is an opportunity for a Chemist or Chemical Engineer who has had mill experience in the application of latex coatings to paper.
Send resume to: Mr. C. G. Durbin,

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Experienced—for modern solid bleached sulphate board mill. Man for New England. Also for Eastern states. Salary and expenses. No brokers or agents. Our own sales staff knows of this advertisement. Send full details in complete confidence. Box 58-264 care Paper Trade Journal. O-27

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French Engineer with fluent English specializing in the sale of pulp and paper-making machinery seeks agencies for representation of American firms in France.

Write: **MR. MAURICE VAUCHER**
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Sales & Service representative allied to paper industry, Eastern States. Over 10 yrs. experience in sales of Chemicals & Process Equipment.

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Thorough knowledge all phases paper exporting seeks position preferably with mill. Traveled heavily Latin America, have customer and agent following, able set up export organization, under 40, can relocate. For further discussion please address Box 58-266, Paper Trade Journal. O-20

SUPERINTENDENT AVAILABLE — Interested in challenging assignment which will utilize my training and experience in cylinder specialties. Address Box 58-258 care Paper Trade Journal. O-27

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We have small machine shop near Paris (30 miles). Looking for licensing agreement for manufacturing paper machine parts and accessories. Already many good references in U.S.A.—Please write to:

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SAINT-GERMAIN-SUR-MORIN
(Seine-et-Marne)
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Fales Slitter,
Model B, 40 inches
Reply Box 58-260 care Paper Trade Journal
O-20

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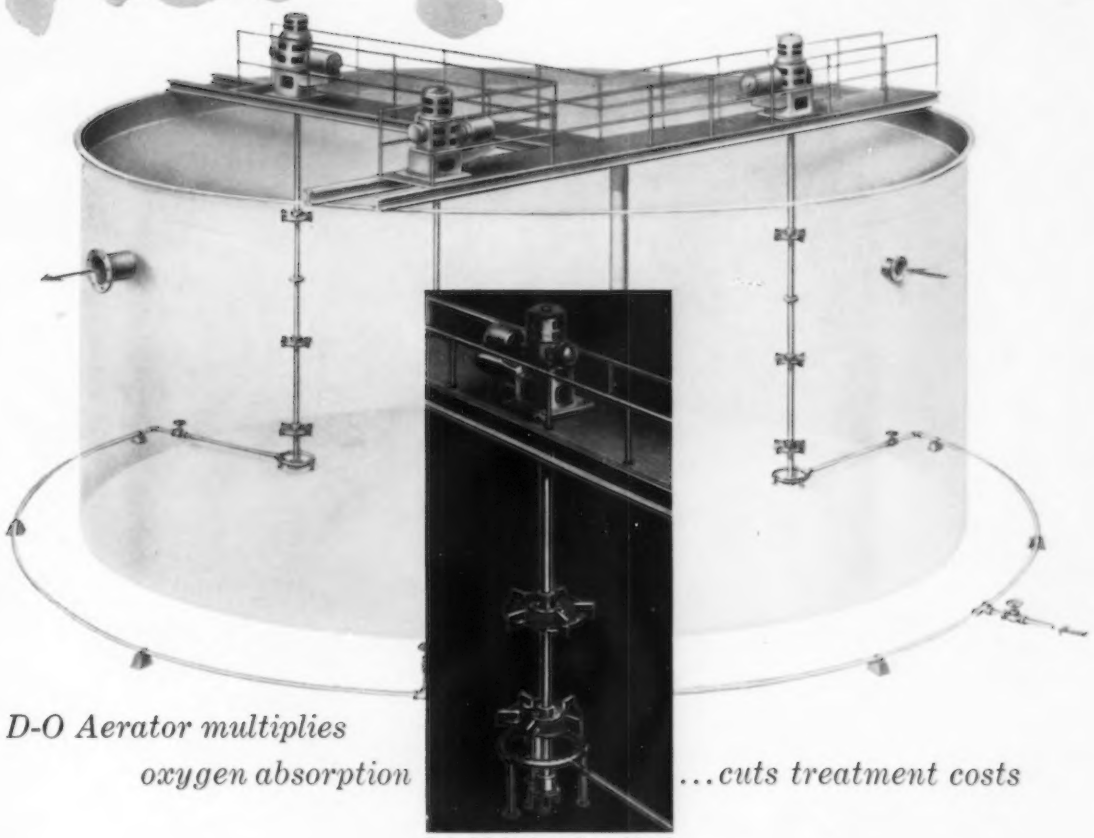

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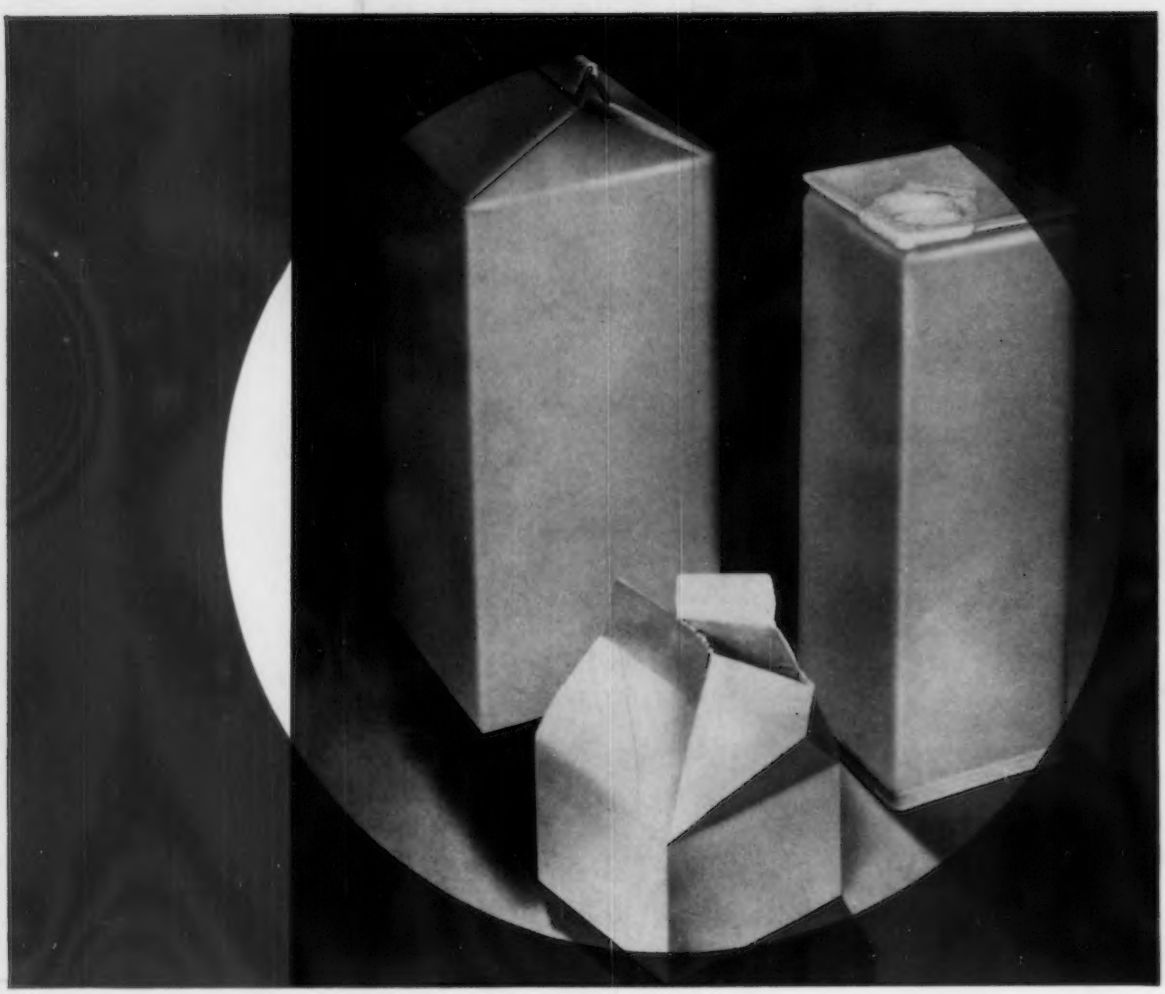

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